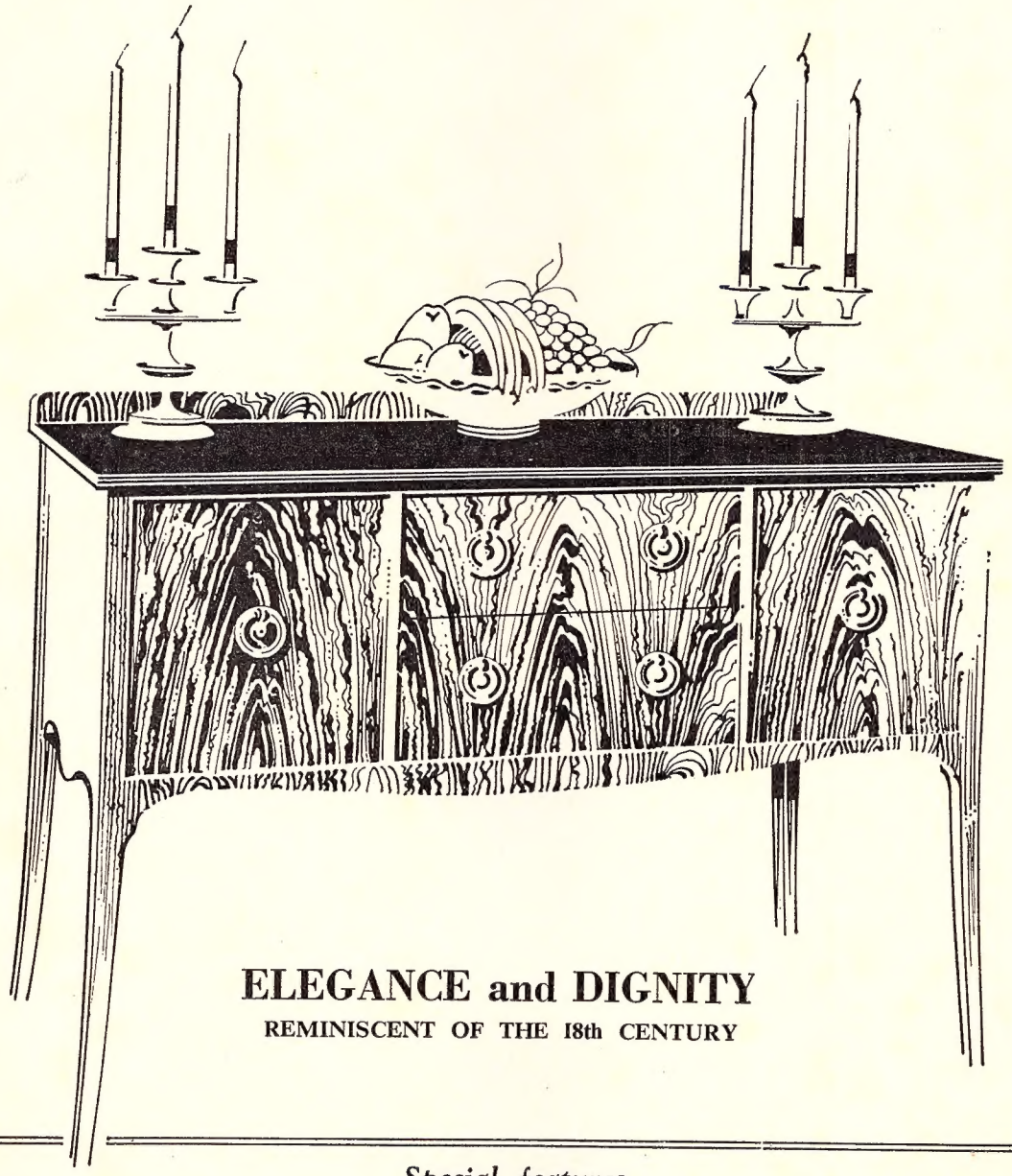
WOODWORKER

VOL. LX. No. 750. MAY 1956 ONE SHILLING



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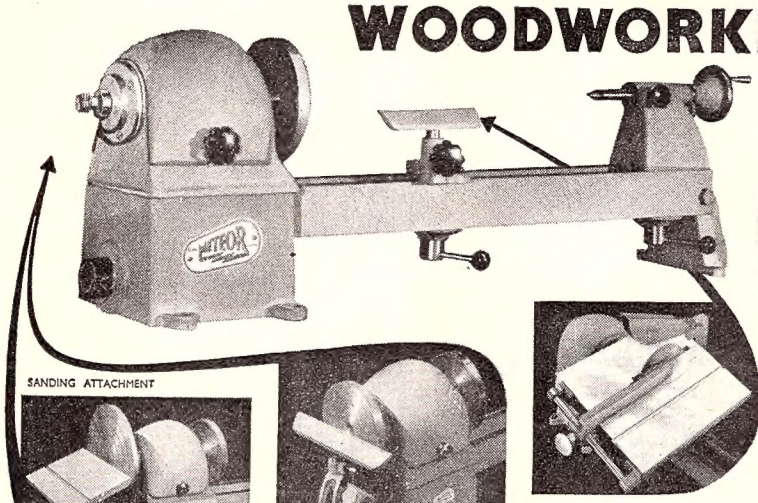

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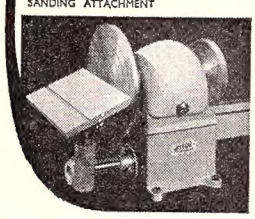

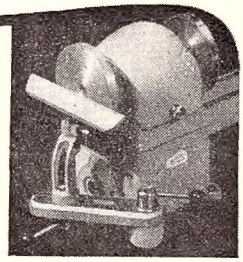

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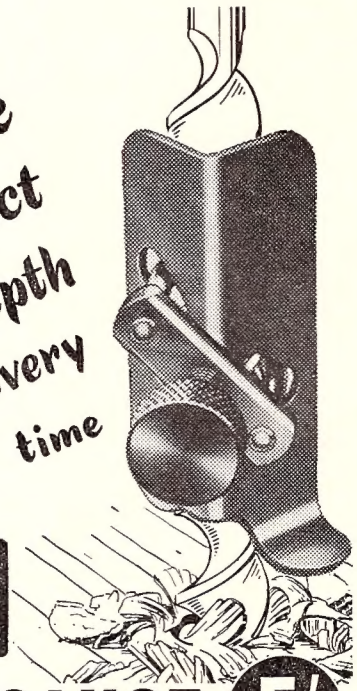

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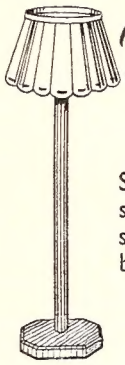

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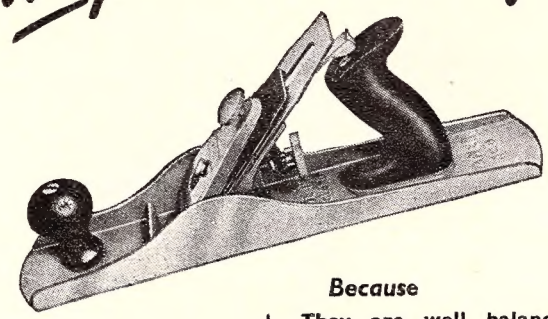

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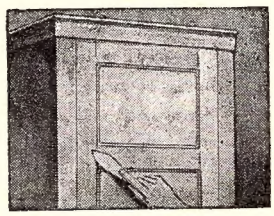

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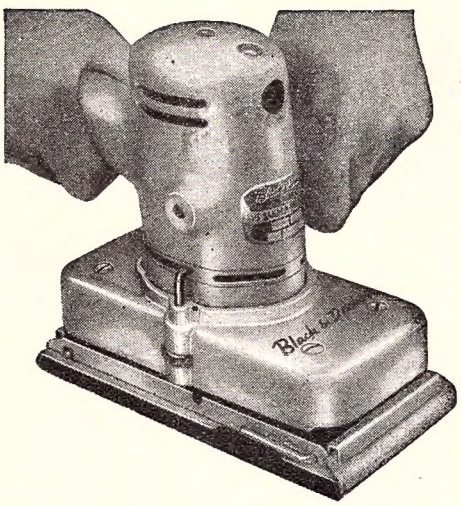

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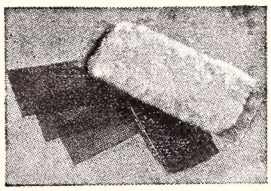

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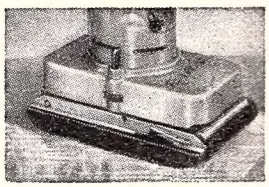

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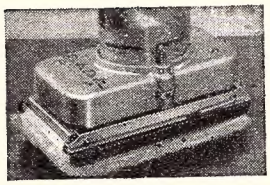

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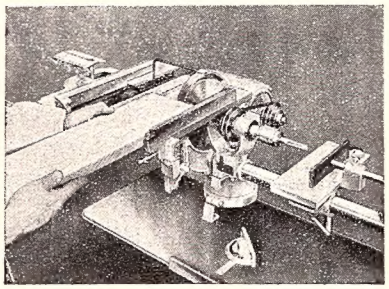

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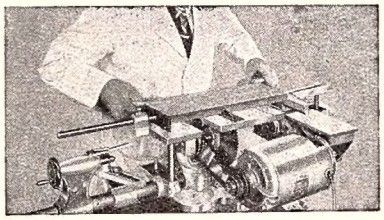
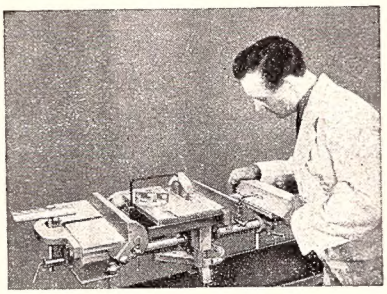


THE COMBINATION TABLE—being used for Panel Cutting. Very useful for repetition work



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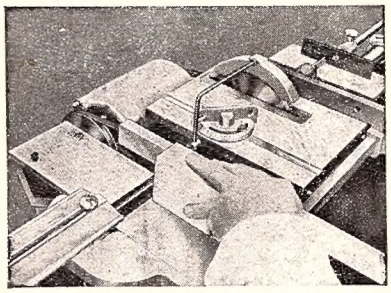

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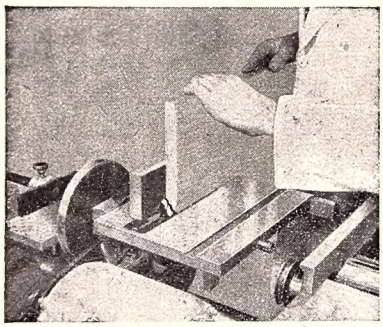

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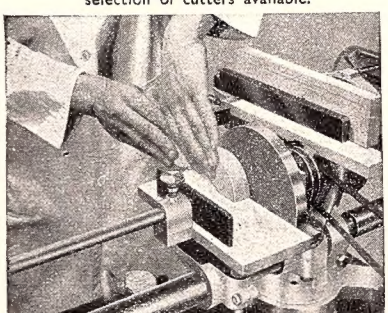

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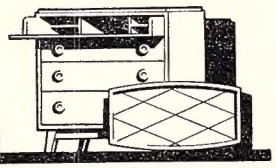


FURNISHING THE SMALL HOUSE

HEADBOARD FITMENT for the TEEN-AGER

Divans are finding increasing favour, and alternative head fittings for these are shown in this article. When space allows a fitment as illustrated in Fig. 1 can be both useful and attractive in appearance. It is flanked by one or a pair of bedside cupboards. Fig. 2 gives a simple headboard which may have an extension on one or both sides. Small shelves on continental lines are fitted as shown

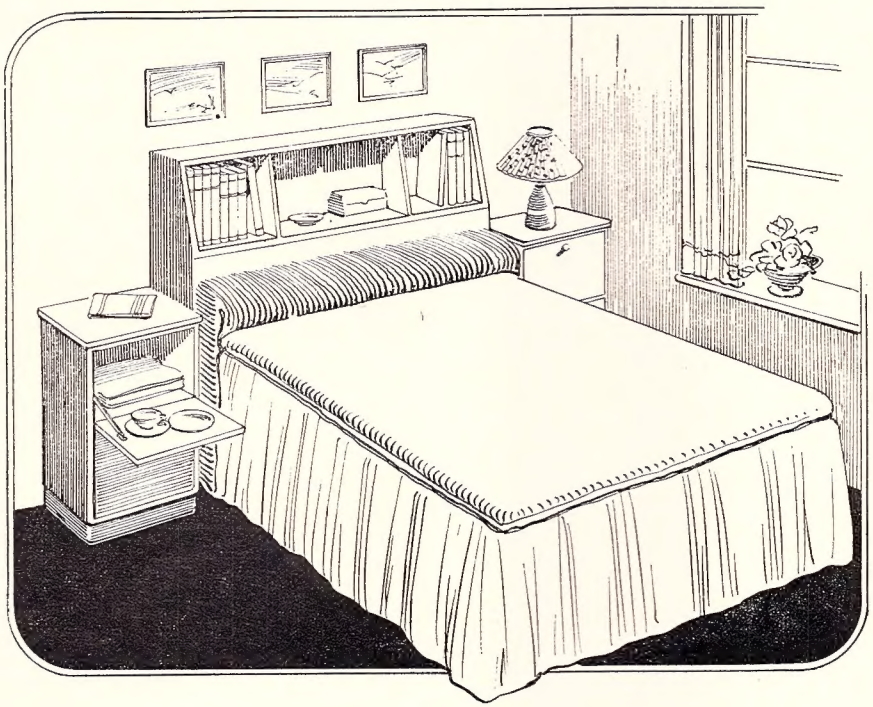


FIG. 1. DIVAN HEAD FITMENT WITH FLANKING PEDESTAL CUPBOARDS

The centre fitment and the pedestals are made up as separate carcases. The actual arrangement of shelves, etc., and the sizes can be made to suit individual circumstances

THE compartment enclosed by sliding doors in the fitment (Fig. 3) might be omitted if desired and the front panel carried up to the shelf of the open bookshelf as in Fig. 1.

Fitment.—Prepare the ends (A) and top (B) and rebate each for the back (if fitted). The back may be omitted if preferred. Stop trench the ends $\frac{1}{4}$ in. deep for the shelf or shelves and groove for the front panel (E). Also sink mortises for the bare-faced tongued stiffening rail (D). Ends and top are secret lap-dovetailed together as shown in Fig. 4.

The shelves have groovés worked through for the sliding plywood doors, the top grooves being $\frac{1}{2}$ in. deep and the bottom grooves $\frac{1}{4}$ in. deep. The doors have $\frac{3}{16}$ in. cover at the top enabling them to be lifted in and out. The

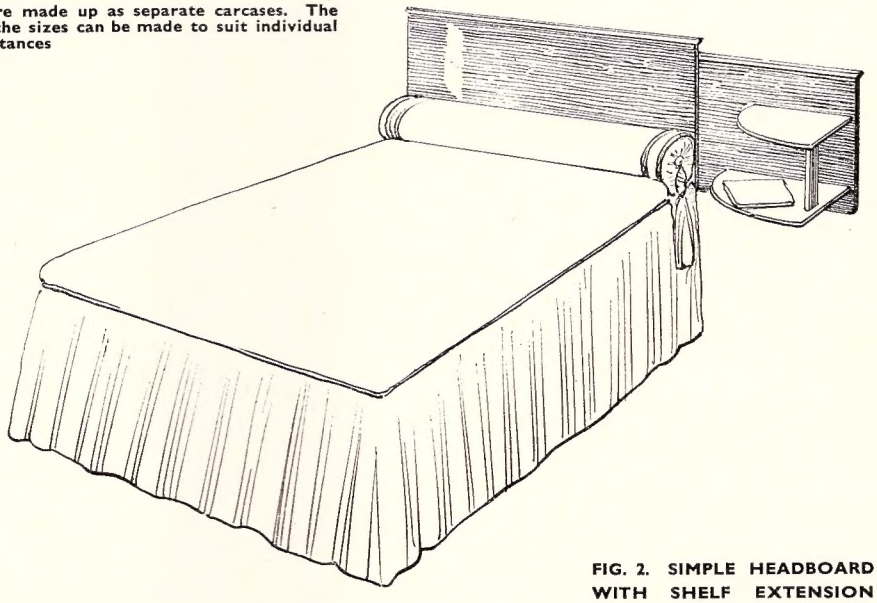


FIG. 2. SIMPLE HEADBOARD WITH SHELF EXTENSION

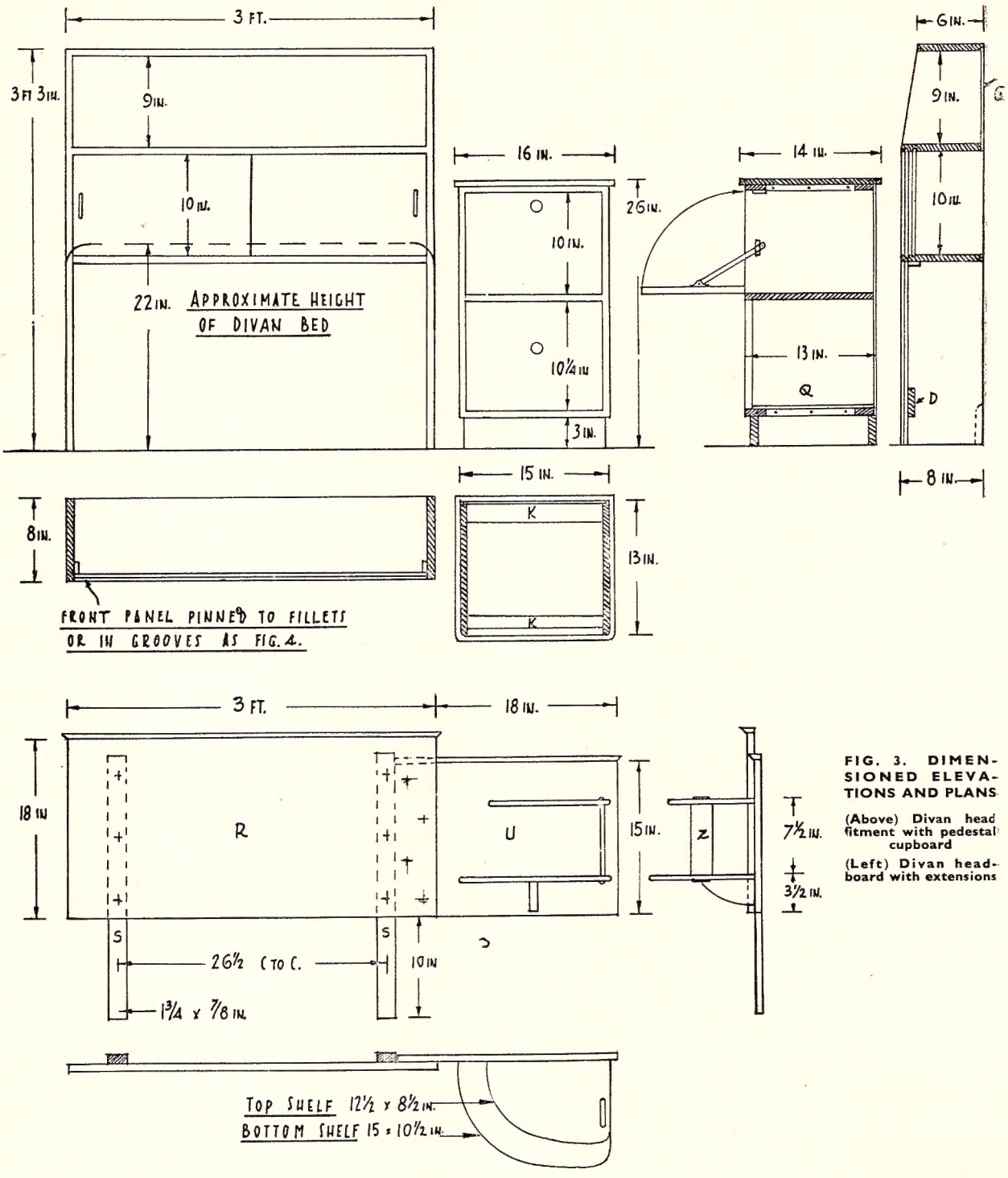


FIG. 3. DIMENSIONED ELEVATIONS AND PLANS

(Above) Divan head fitment with pedestal cupboard

(Left) Divan headboard with extensions

shelves are housed to the ends ¼ in. deep. Make sure that the front shoulders of the shelves are glued. It is as well to fill in the door grooves at the extreme ends where they enter the housings. This is done after the carcases are assembled.

The front panel (E) is pushed into the grooves from below and is pinned to a fillet beneath the shelf. Before assembly the ends are cut back as shown by the dotted lines, Fig. 4, and are finished with the plane afterwards. The ends (A) will need cutting away for the room skirting (Figs. 3 and 4).

Bedside Cupboard.—Prepare the ends (H) and rebate for the carcase back (P). Connect with four rails (K) lap-dovetailed at top and bottom. The central

shelf (J) is housed in ¼ in. deep. The fall (L) and door (M) in veneered plywood or chipboard are hinged with 2-in. brass butt hinges. An easy working stay (not a friction stay) is fitted to the fall.

Blocks are screwed to the ends between top and bottom rails (K), and a ¼ in. thick plywood cupboard bottom (Q) is glued and pinned on as shown in Fig. 4. The front corners of the ends and top are rounded, see plan, Fig. 3.

Headboard.—In veneered plywood or chipboard the outside edges will need lipping. Cleats are screwed on behind the panel as shown in Fig. 4, fitting into metal sockets fixed to the divan. Alternative sockets are shown in Fig. 4. The moulded capping is glued and pinned to the top edge, pins being punched in and the holes filled.

The extension (U) in similar material is screwed to the rear of the main headboard (R). Shaped shelves from good quality chipboard are fixed by screwing from the rear, and are connected by a banister (Z) which is tenoned through the shelves and the ends rounded. A small bracket supports the lower shelf centrally.

Chipboard or plywood items are indicated below the cutting list. The remainder can be in solid wood such as oak, mahogany, or comparatively inexpensive timbers such as obeche or limba. A natural finish is suggested. (258)

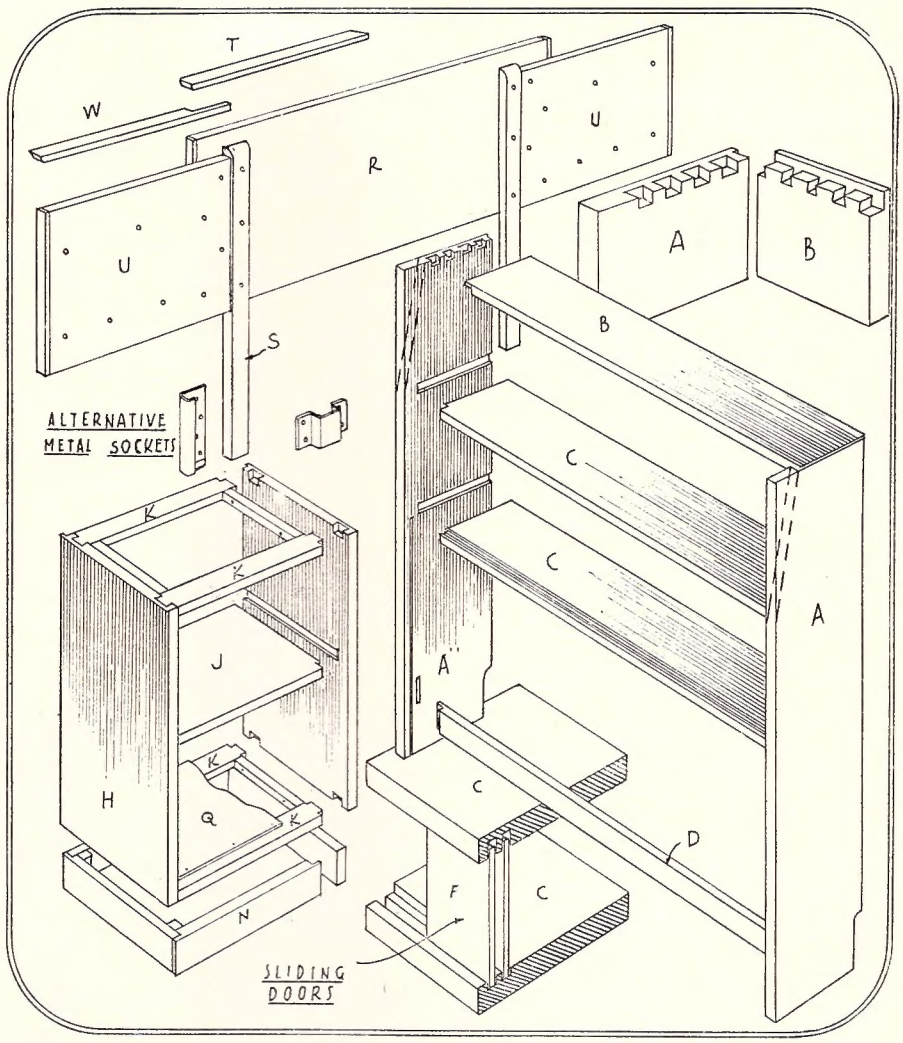


FIG. 4. METHOD OF CONSTRUCTION
The rear view of the headboard (above) shows the twin extensions

CUTTING LISTS

DIVAN HEAD FITMENT

		Long ft. in.	Wide in.	Thick in.
(A)	2 Ends	3 3½	8½	¾
(B)	1 Top	3 0½	6½	¾
(C)	2 Shelves	2 11½	8½	¾
(D)	1 Rail	3 0	3	¾
(E)	1 Front panel	2 11	18½	¼
(F)	2 Sliding doors	1 6	11	¼
(G)	1 Back	3 0	10½	¼

Should only the Bookcase be required omit F and 1 of C. Increase the width of E to 29 in.

BEDSIDE CUPBOARD

(H)	2 Ends	1 11	13¼	¾
(J)	1 Shelf	1 2½	13	¾
(K)	4 Rails	1 3	2¼	¾
	4 Blocks	9½	1	¾
(L)	1 Fall	1 2	10¼	¾
(M)	1 Door	1 2	10½	¾

		Long ft. in.	Wide in.	Thick in.
(N)	1 Plinth front	1 2½	3¼	¾
	2 Plinth ends	1 1½	3¼	¾
	1 Plinth back	1 2	3¼	¾
(O)	1 Top	1 4½	14¼	½
(P)	1 Back	1 11	15	¼
(Q)	1 Cupboard bottom	1 2	12¼	¼

HEADBOARD

(R)	1 Board	3 0½	18¼	¾
(S)	2 Cleats	2 2½	2	⅞
(T)	1 Cap	3 1½	1½	½
(U)	1 Extension	1 10½	15¼	¾
(V)	1 Bracket	6	3	¾
(W)	1 Cap	1 11	1½	½
(X)	1 Shelf	1 1	9	½
(Y)	1 Ditto	1 3½	11	½
(Z)	1 Banister	9	2¼	½

Allowance has been made on lengths and widths for trimming. Thicknesses net.

Items L, M, R, and U ¾ in. thick plywood or chipboard.
Items O, X, and Y ½ in. thick chipboard.
Items E, F, G, P, Q ¼ in. thick plywood or hardboard.

CHIPS FROM THE CHISEL

MANY POSSESSIONS

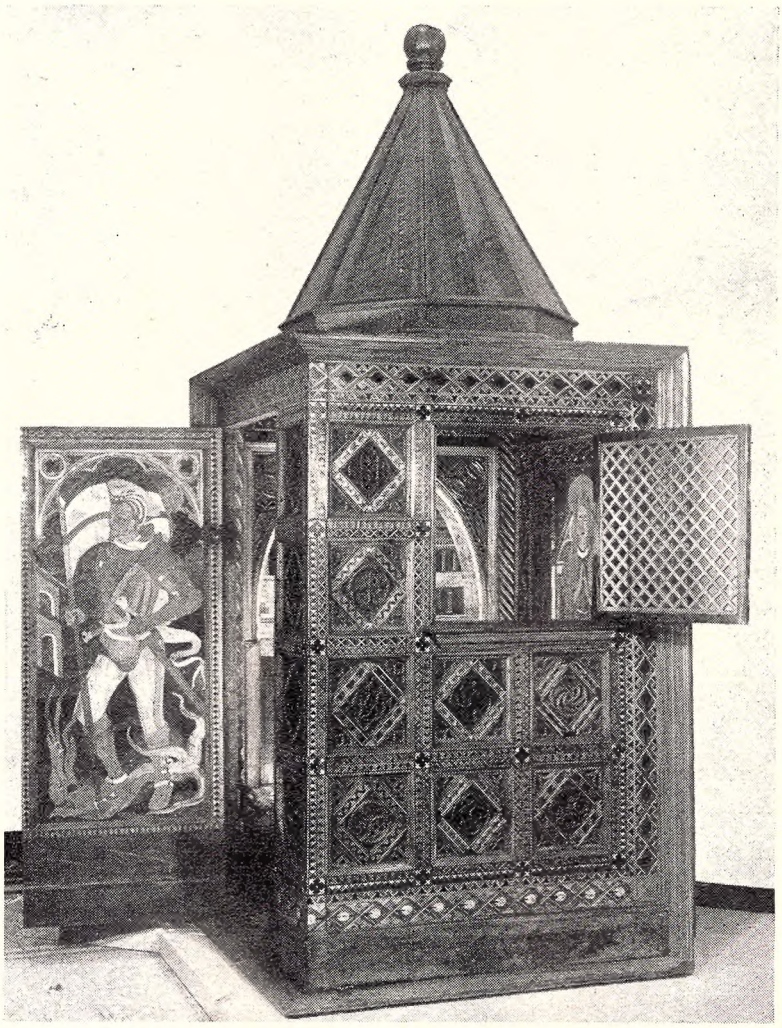
"—The only true solution appears to lie with the home woodworker and in the few workshops still turning out hand-made furniture"

NOWADAYS when we speak of craftsmanship we speak of something with a long history behind it, inextricably part of the social progress of mankind: we think of it as essentially a product of civilised living. It is just as well to remind ourselves sometimes, therefore, how naturally and instinctively it was born in the very earliest times, once men began to fashion for themselves vessels of clay and to learn the use of metals. We can see how it had its beginnings in the sheer joy of achievement. Excavations all over the world have revealed ample evidence of how swiftly, once men discovered how to make simple tools and utensils, they proceeded to perfect and adorn them in evident pride and pleasure both in their own workmanship and in the thing they owned.

* * *

With the passing of the centuries and the growing complexity of life we have travelled very far from this first simple pleasure of a man in his work. It is something which every true craftsman does feel, though maybe less strongly than his remote ancestors. We are men of many possessions and it is difficult for us to recapture that first thrill of one who finds himself able to fashion the raw materials of living, wood, clay and metal, not only into articles for his use but into objects of beauty which he can rejoice in. All his care was lavished upon a few essential possessions in a supreme economy of effort, and what marvellous technical skill was developed as a result! We see symmetrical shapes evolving and first primitive attempts at decoration, beginning with scratched lines emerging in course of time as formal patterns, till gradually his scope widened to embrace the whole of life as he knew it. In wood and stone, enamels and precious metals, in linen and pottery, on vellum and glass, he wrought and carved and painted, making his patterns out of flowers and fruit and foliage and a veritable Noah's Ark load of animals, real and mythical. Everything that came into his field of vision, including the activities of his fellow men, went into his work until, at its height in the Middle Ages, it became the very poetry of craftsmanship. Inspiration waxed and waned through the following centuries as social conditions changed, but the nineteenth century gave the final devastating blow to the joyous spontaneity of craftsmanship with the coming of the machine age. Once ornament could be bought at so much per foot it soon lost its magic. It no longer enhanced the value

(*Continued on page 99*)



CARVED AND INLAID ORATORY WITH PYRAMID TOP

This elaborate example of church furniture dates from about 1500 and is of Italian origin. It was probably made for the private chapel of a church or monastery. It has two decorated sides only, the other two being rough and intended to face into the north-east corner of the sanctuary. The decoration is in carved open work panels with frames and borders of geometrical inlay about $\frac{1}{8}$ in. thick. Inside the designs take a freer form of intarsia with figures and buildings, etc., in perspective.

The practical reader may like to reflect for a moment on the tremendous amount of work involved in the oratory, and in the invention and imagination of the designer. Not only is each open carved Gothic roundel different from every other roundel, but each set of corner carvings varies from all the others. If you would like to see what this involves draw a small triangle and see how many variations you can sketch into it.

Then consider the inlays of the borders and frames alone. The number of pieces of inlay would run into many thousands. No doubt the craftsman would have found a short cut by cutting several in one operation and then slicing through. But even so the time required would be colossal when it is realised that all timber had to be cut by hand. Apart from anything else it forms a good object lesson in patience.

Photograph by permission of the Director of the Victoria and Albert Museum.

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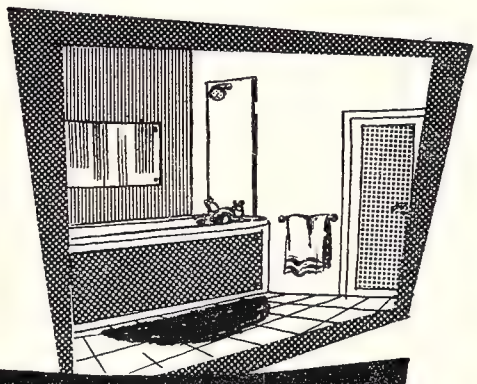

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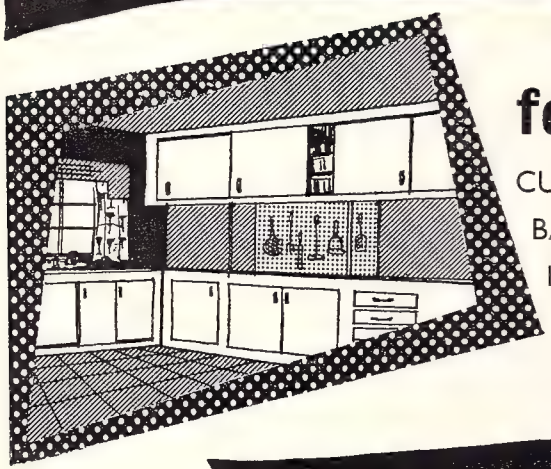

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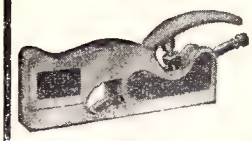

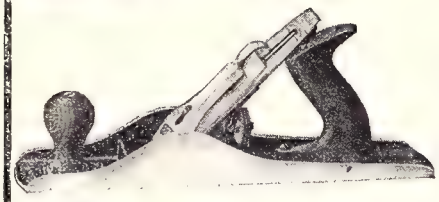

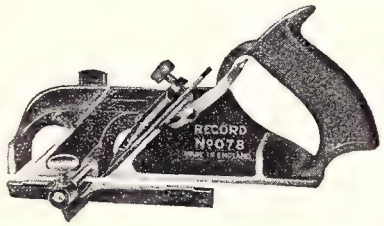

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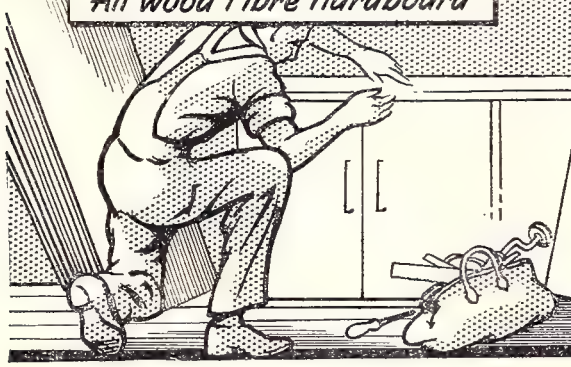

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8. METHODS OF FINISHING

THERE is no easy way of obtaining a fine, durable finish on furniture. Even in the best-equipped factories finishing accounts for around 20 per cent of the total cost.

Some of our friends around the town are keen woodworkers, and often we are invited to their homes and workshops to pass judgment on some completed article. We really do enjoy these visits. It is the one time we are sure of a deferential hearing. While we examine the piece the hush is practically breathless and that is the bit we enjoy most.

Now we have devised a simple test for these happy occasions which you can apply to your own work. Ask yourself, "Would it look out of place in a furniture showroom?" If it would—if it has that unfortunate nandyman look about it—then you are falling short somewhere and 99 times out of 100 it is in the art of finishing.

The design may be good, the jointing and tool finish perfect, and the timber satisfactory: these are important but they are not enough. You can, in fact, get away with poor construction—for a time, anyway. It takes a fellow woodworker to find you out quickly there, or ordinary usage rather more slowly. But anyone, walking in off the street, can tell at a glance if it lacks that professional look. They can do so—perhaps without being able to say why—because they are accustomed to seeing it daily in the shops.

We are not saying that all furniture on display is good. What we do say is that the finish is invariably good—it has to be or it would never be sold.

When we could not tell whether our friend made it or bought it from a good shop we offer our congratulations. In other cases usually it has not yet dawned on them that the finish requires as much thought and effort as the construction.

So let us think now on different final stages in the polishing routine. We shall deal with these in order of difficulty, easiest first.

Eggshell finish.—Make a pad of No. 1 steel wool which will fit the hand comfortably. Dip this in some good furniture wax. Work firmly along the grain only. Watch these edges. When convenient, position yourself facing along the grain. Have the surface in hand horizontal, if possible, with the bearing surface protected where necessary. Work in straight strokes. Use the thumb or pinkie as a finger gauge or guide near edges. Where necessary, on broad surfaces place a light straight-edge on the work, holding it with the free hand (see D, Fig. 1). The wax acts as a lubricant and holds the steel wool together. Use the minimum only.

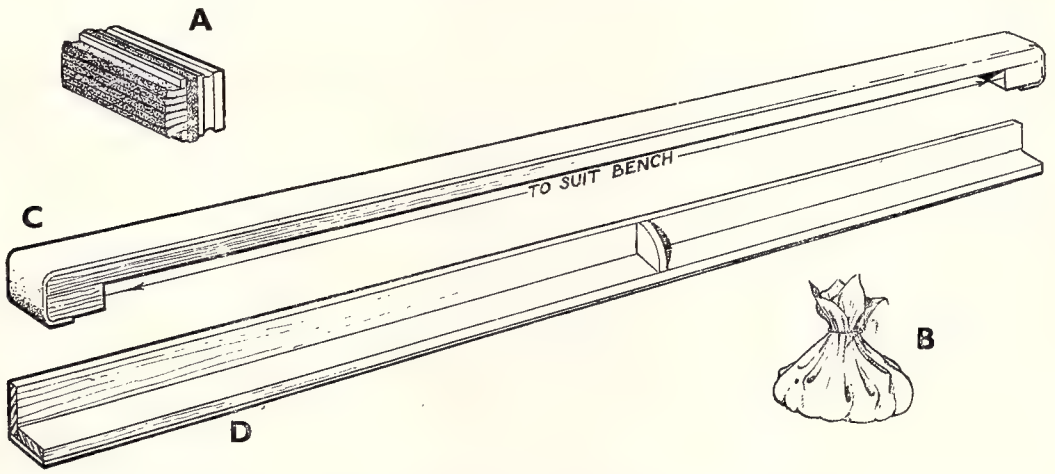


FIG. 1. HOME-MADE APPARATUS USEFUL FOR FRENCH POLISHING

(A) Blackboard duster used as a felt block. (B) Pounce bag made from muslin. (C) Felt-covered dog (one of a pair) for use on the bench or the floor. (D) Straight-edge with felt on base. The lower surface should be slightly hollow so that it does not tend to swivel

Complete the work by rubbing firmly again along the grain with soft, fresh rags. This will remove most of the wax used and bring the surface to the required dull, smooth gloss. The straight-edge should preferably be covered on one side with felt. We use strips of wood something like bench dogs (C) which must be felt covered for protecting bearing surfaces.

Matt finish.—Handling is similar to the above but the lubricant is water and the abrasive the finest pumice powder. Application is with a felt block. In our shop we use blackboard dusters which might have been made for the job (A, Fig. 1). Keep the felt just wet, dip it into the abrasive and spread this evenly over the face. It is essential to work in straight lines. Wipe off with a damp wash-leather. When dry rub over, again along the grain, with soft rags to remove any traces of the pumice remaining. A good full grain body is essential for this finish. The surfaces must be true.

Stiffing.—In this method the surface is made bright and smooth by using the rubber with high pressure.

(*Continued on page* 101)

WORKSHOP PRACTICE

CHAIRMAKING

I. TIMBER AND MARKING OUT

By L. HELMORE,
City and Guilds, first-class (Chairmaking), Instructor in chairmaking, West of England College of Art

Chairmaking has long been a specialised trade. It involves a great deal of shaped work and has its own particular problems. Many parts have to be individually fitted. The writer of this article (which will be continued next month) has had long experience in the craft, and explains the methods generally used.

FIG. 1. AN EXAMPLE OF A STURDY, ELEGANT CHAIR HAVING CLEAN LINES AND GOOD PROPORTIONS

THE timber used for chairs must be strong enough to counteract the short-grain which necessarily occurs in shaped members. For the same reason all defects such as knots, shakes, and splits must be avoided. So too must low density hardwoods and most softwoods which are quite unsuitable except perhaps for building up shapes on stuff-over frames, provided no constructional weakness would result.

Timber.—As a general guide timbers of not less than 35 lb. per cubic foot in weight and having not more than 15 per cent moisture content will prove satisfactory. Straight grain may be an advantage for some parts although it is possible for curved members to gain strength by following the line of the grain.

Birch, beech, oak, cherry, Cuba and Honduras mahogany, walnut, mansonia, ash, and yew are reliable timbers. Others including elm, sapele, and African mahogany will give little trouble if selected. For stuff-over parts to be completely upholstered birch and beech are satisfactory from both the constructional and upholstery points of view.

Although new methods of construction are proving successful (and there is plenty of scope in this field) experience is the only true guide. To the beginner in chairmaking, therefore, traditional shapes and construction are the most straightforward. There are in all homes chairs to guide the reader in heights of seat, pitch of seat and back, and general sizes for different types of chairs.

Having decided upon the design to be made, full size drawings are required, preferably front elevation, sectional side elevation, and plan. If this is not possible a side elevation will show the shape of the back leg and front legs, and the dimensions and positions of many of the rails.

The working drawings in Fig. 3 are for the chair shown photographically in Fig. 1, and are used in making templates, cutting the various parts, jointing, and assembling. A similar procedure would be followed in most chairs of this type with of course, allowances for different sizes, shapes, and so on.

Templates.—From the full size elevation make a template of the back leg (E) in cardboard or thin plywood. This may be done by using carbon paper, pricking through the drawing, or by direct measurement from drawing to template material. The template should also be marked to show the position of the back rail (G), slats (B, C, and D), and the line of the top joint. Watch that the template is wide enough to conform to the curve of the top. For instance in Fig. 3 (X) (J) is the

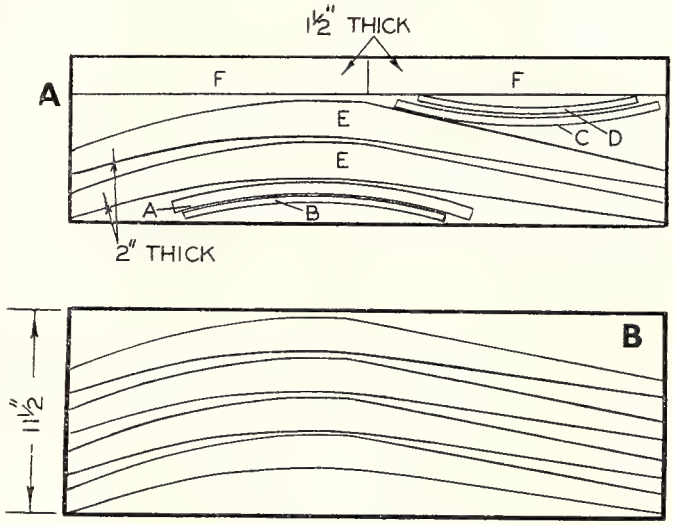
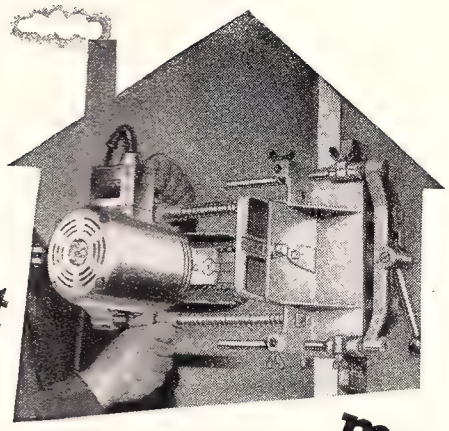


FIG. 2. SETTING OUT. (A) Arranging the shapes for a single chair. (B) suggested arrangement when two or more are contemplated



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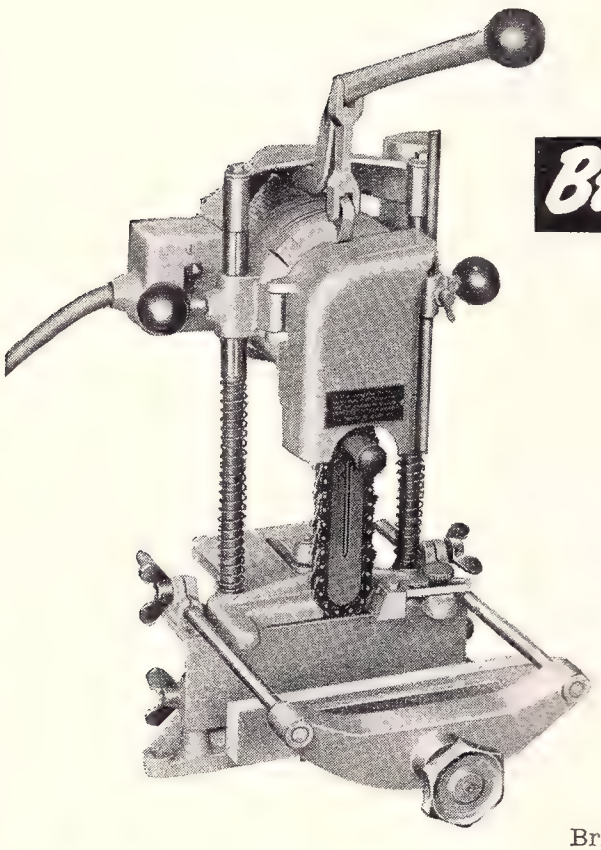

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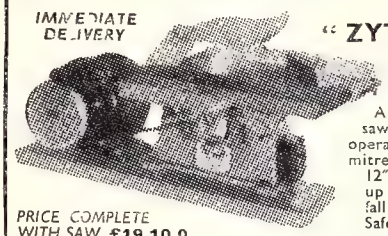

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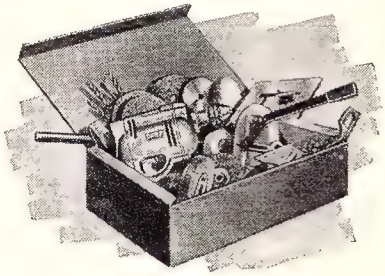

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template width and (K) actual width.

Templates are also needed for the top (A) and for the slats (B, C, and D) which need allowance on the length for tenons at both ends. It will be seen that the top and the slats are cut at an angle. A dimentioned section of a slat is shown in in Fig. 3 (Y). The top rail is at the same angle but is $\frac{7}{8}$ in wide. If these parts are to be cut square and bevelled with the spokeshave, allowance for the angle must be made on the template, but if bevelled cuts are possible, either by canting the bandsaw table or by bowsawing at an angle the template may be cut out to actual width.

Mark all templates with the thickness of timber from which the pieces are to be cut, i.e., the top 1 in., the slats $\frac{7}{8}$ in., and the back legs 2 in. It should be noted here that, although the greatest width on the face of the back legs is $1\frac{1}{8}$ in. (at the seat), the shape at the top end requires a thickness of 2 in. A template of this shape should be made from the top of the seat rail to the extreme top. The joint for top is marked but not cut. A cutting list can be made for the size of all other parts.

The procedure for marking and cutting these parts depends upon the facilities open to the reader. If machines are available much of the chair may be cut from one board, thus keeping colour and texture similar. Alternatively those using hand methods throughout will no doubt wish to avoid unnecessary hard work, and prefer to buy timber already cut to size.

To mark the back legs separately is wasteful. It is advisable therefore to select a board of such width to allow a convenient number to be marked in with one another. This of course depends upon the number of chairs to be made; two legs require $6\frac{1}{2}$ in.; three 9 in.; four $11\frac{1}{2}$ in., with in each case the same amount of waste.

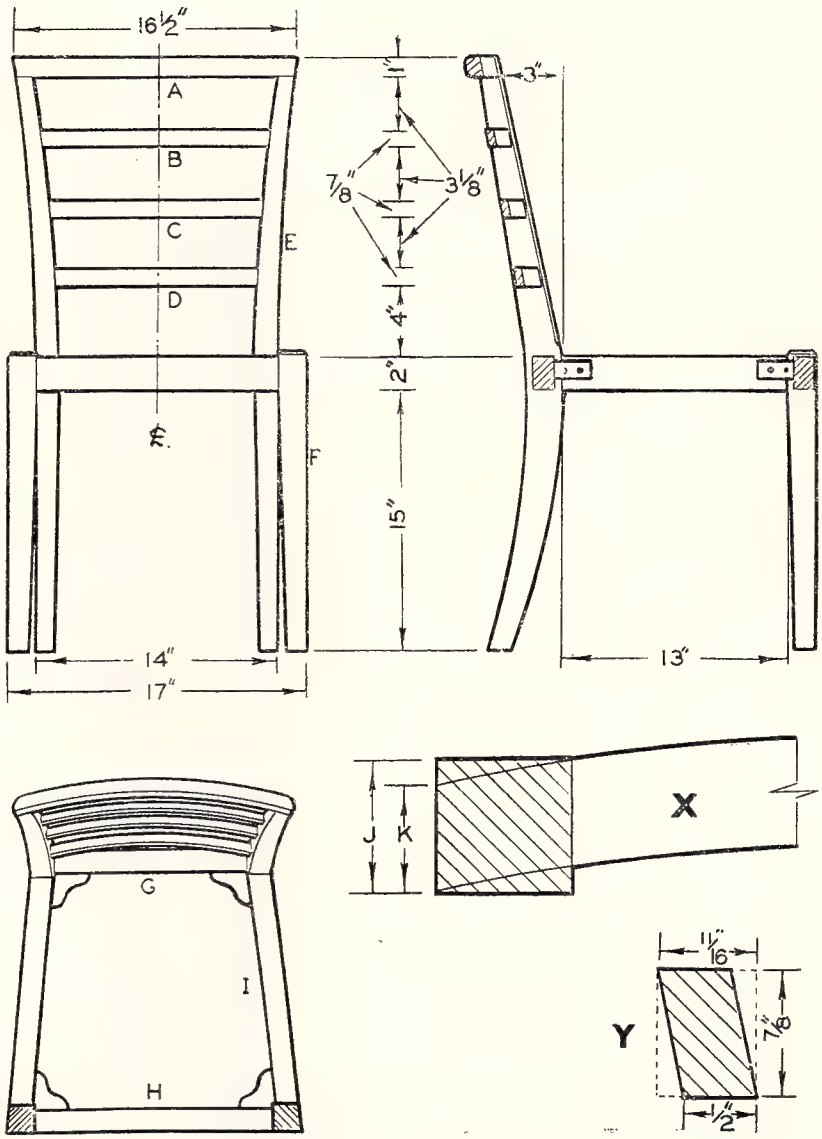

FIG. 3. PLAN, ELEVATION, AND SECTION WITH DETAIL OF TOP RAIL AND SLAT

Fig. 2 (A) shows the main shaped sections marked out on one board. The top rail and slats would be deeped to thickness before cutting the shape. Fig. 2 (B) gives four back legs marked out on an $11\frac{1}{2}$ in. board. Note that in all shaped members the grain runs in line with the extreme ends.

Cutting out.—Cutting out by bandsaw need not be discussed here except to suggest that the board should first be planed to the thickness of the components to be marked thereon. The others can be reduced to finished sizes separately after cutting.

Hand cutting can be an arduous task, and it is worth putting some thought into the preparation. First select a good clean flat board and plane one side. Place the back leg template in position, extreme top and bottom close to the edge, and carefully mark round it with a pencil. Move the template to the next position leaving only sufficient space for one saw cut at the closest part at seat level. Again keep the ends in line with the grain and mark round. Follow this procedure with the top and

(*Continued on page* 101)

Description	Number	Cutting size	Shoulder size	Particulars
F Front legs	2	1 ft. 6 in. by $1\frac{1}{2}$ in. square		
G Back rail	1	1 ft. $1\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by $1\frac{1}{8}$ in.	$11\frac{3}{4}$ in. (cut square)	Tenons both ends
H Front rail	1	1 ft. $4\frac{1}{2}$ in. by $2\frac{1}{4}$ in. by $1\frac{1}{8}$ in.	14 in. (cut square)	Tenons both ends
I Side rails	2	1 ft. $2\frac{1}{2}$ in. by $2\frac{1}{4}$ in. by $1\frac{1}{8}$ in.	13 in. (bevelled)	Tenon one end

WALL MAGAZINE RACK

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This useful magazine rack is suitable for the average fourth year boy although some third year boys will also be capable of making a good job of it. It can be in any suitable hardwood and mahogany, rauli, or Nigerian walnut are suggested

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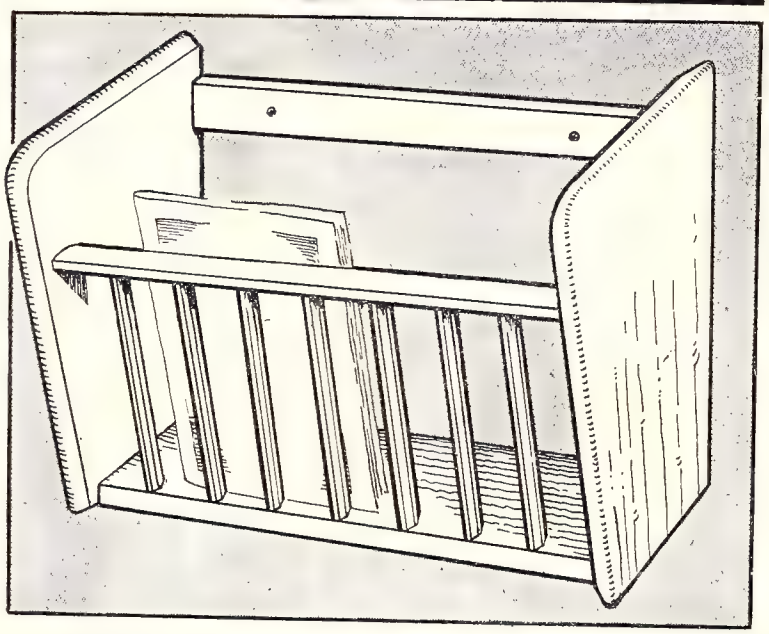

FIG. 1. A NEAT AND ATTRACTIVE ITEM FOR THE HOME

THE back rail is attached to the ends with single lapped-dovetails as shown in Fig. 4 (A). To give added security screws could be driven through the joints into the ends. Screw holes are bored through this rail for fixing the rack to the wall. Fig. 4 shows the bottom fixed to the ends with lapped-dovetails. The front rail is rounded on the top edge and is connected to the end panels with $\frac{3}{16}$ in. dowels as in Fig. 4 (B). The bars are held between the bottom and front rail with similar dowels, Fig. 4 (D).

Procedure.—Prepare two pieces of $\frac{5}{8}$ in. material for the ends to finish 13 in. by $5\frac{1}{2}$ in. Plane the back rail from $\frac{3}{8}$ in. stuff to $14\frac{1}{8}$ in. by $1\frac{1}{2}$ in. The base, made from $\frac{5}{8}$ in. stuff, is planed to finish $3\frac{1}{4}$ in. wide and exactly the same length as the back rail.

Make and fit the dovetail joints. While in the dry state, plane the front rail to $\frac{7}{8}$ in. by $\frac{1}{2}$ in. in section and cut it to fit tightly between the ends. Separate the joints and mark out the outline shape of the ends. This can be obtained from Fig. 2, the radiused corner being of any suitable size. Shape the edges with saws, plane, and spokeshave.

Mark on the inside of each end the section of the front rail in its correct position. Find the centre and drill a $\frac{3}{16}$-in. diameter hole $\frac{3}{8}$ in. deep to receive the dowel. Drill both ends of the rail and glue in the dowels, leaving $\frac{3}{8}$ in. projecting on each. Plane and glasspaper the curve on the front rail to a section similar to that shown in Fig. 4 (B).

Prepare seven pieces of batten to $\frac{3}{4}$ in. by $\frac{1}{2}$ in. in

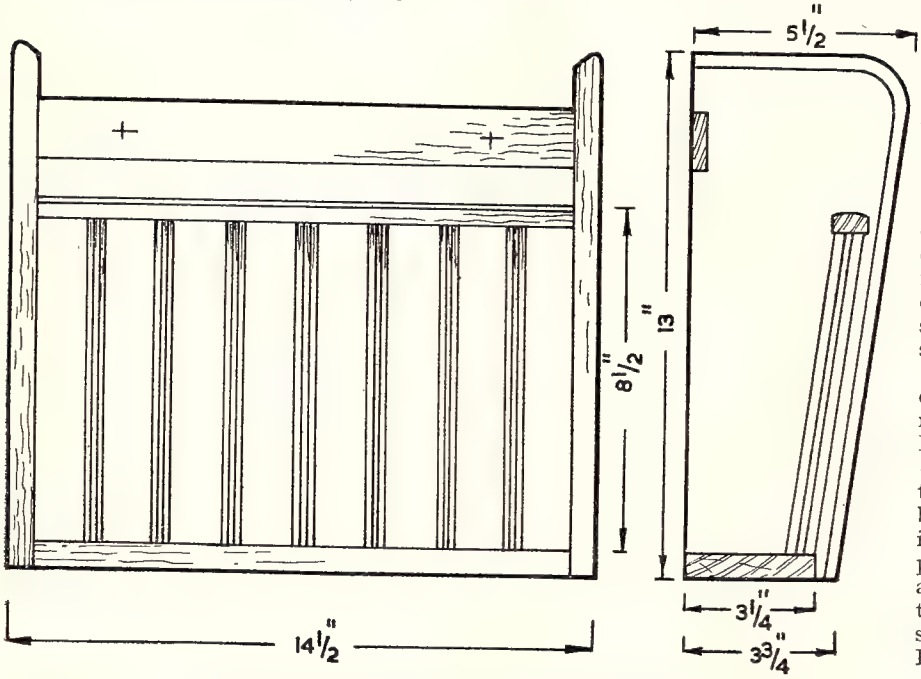

FIG. 2. FRONT ELEVATION AND THROUGH SECTION

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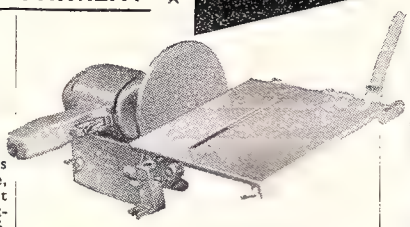

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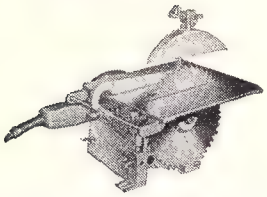

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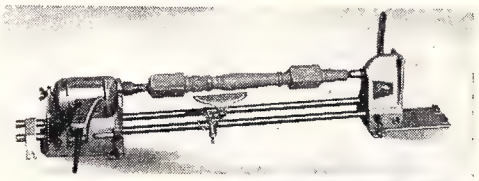

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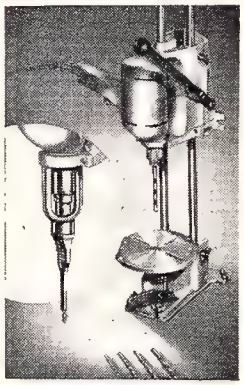

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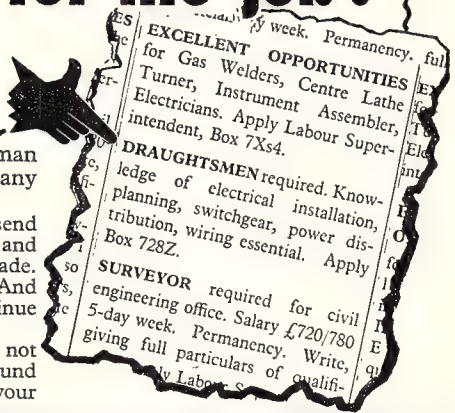
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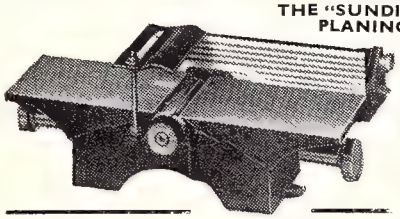

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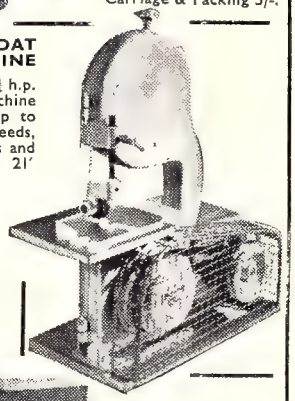

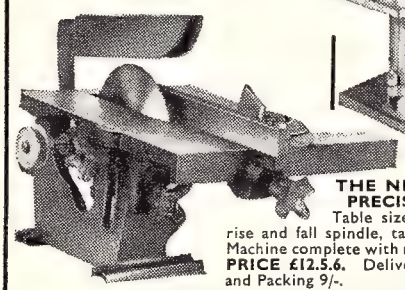

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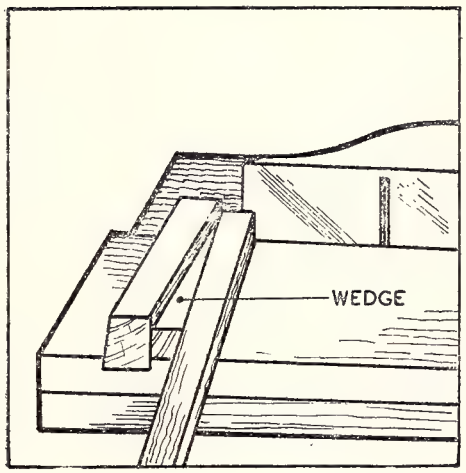

FIG. 3. SHOOTING THE RETAINING BARS

A wedge shaped to the correct angle placed against the shooting board block ensures that the angles are uniform

and insert the dowels into the front rail. Glue the base dovetails and gently tap the joints on to the ends, at the same time guiding the dowels on the bars into their respective holes on the base board. This last job is best done by two people, one guiding the bars into position while the other drives the dovetails home. Lightly tighten a cramp over each bar in turn to draw up the

CUTTING LIST

	Long ft.	Long in.	Wide in.	Thick in.
2 Ends	1	$1\frac{1}{2}$	$5\frac{3}{4}$	$\frac{5}{8}$
1 Bottom	1	$2\frac{3}{4}$	$3\frac{1}{2}$	$\frac{5}{8}$
1 Back rail	1	$2\frac{3}{4}$	$1\frac{3}{4}$	$\frac{3}{8}$
1 Front rail	1	$1\frac{3}{4}$	1	$\frac{1}{2}$
7 Bars		$8\frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{2}$
Dowel Rod	1	6	—	$\frac{3}{16}$

Working allowances have been made on lengths and widths. Thicknesses are net.

section for the bars, taking care that all are of exactly the same length. As these are inclined from the vertical, see detail in Fig. 4 (D), the ends must be cut at an angle. This is best achieved by using the shooting board as in Fig. 3. A wedge is made to suit the angle required and can be obtained from one of the prepared ends. It is held between the shooting block and the wood while each end is shot true.

Drill $\frac{3}{16}$ in. holes in the centre of each end of the bars for dowels. Each hole is drilled at right angles to the end face as indicated in Fig. 4 (D). Arrange for each dowel to project by $\frac{1}{4}$ in. when glued in place.

The underside of the front rail and the top of the base board is marked out to the dowel hole centres, bearing in mind that the front edges of the bars are flush with the edge of the base but centrally placed under the front rail. Drill the $\frac{3}{16}$ in. holes to a depth of a $\frac{1}{4}$ in. full.

Plane the bars to one of the sections shown in Fig. 4 (C). The wood can be held in the vice while planing either of the sections shown on the right, but for the others it will be found easier to rest the wood in a cradle or jig.

The edges of the ends are moulded as in Fig. 4 (A), the chamfer being completed before the edge is rounded.

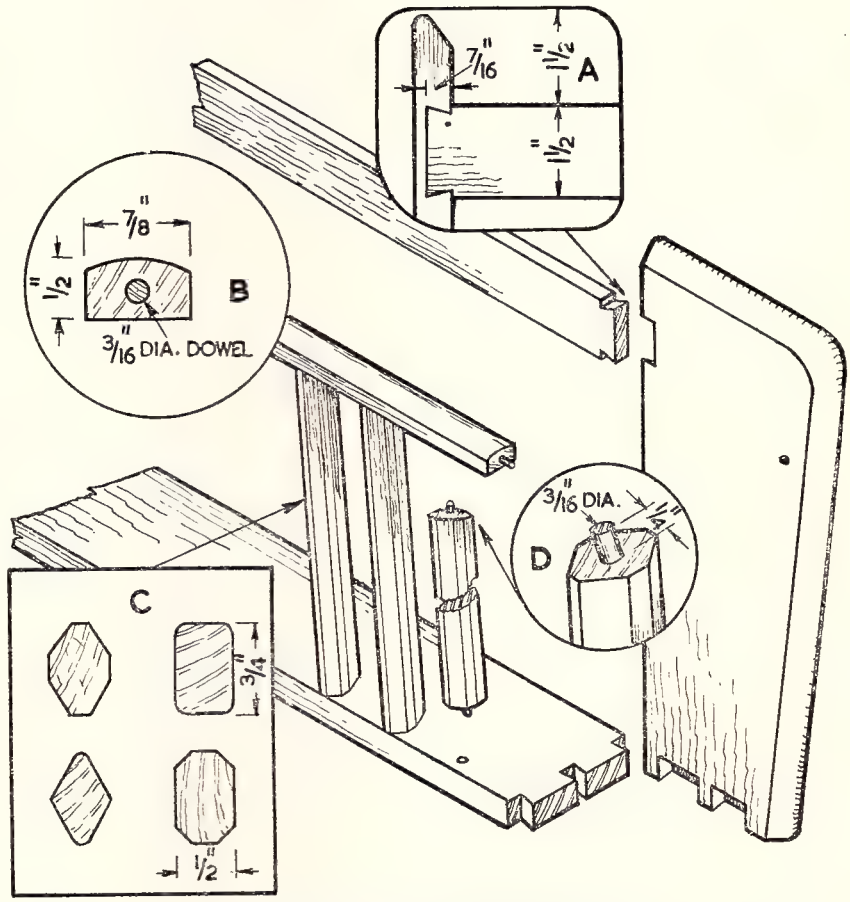

FIG. 4. DETAIL OF CONSTRUCTION

(A) Back rail lap-dovetailed into the side. (B) Dimensions for top front rail. (C) Alternative shapes for front bars. (D) Method of fixing the bars

Assembling.—After boring two holes in the back rail for the fixing screws clean up the parts and glasspaper all inside surfaces. Glue in the back and front rails putting a cramp across the front rail, check for squareness, and allow to set. Glue the ends of the bars shoulders. Leave the assembly cramped square until the glue has set.

Finish.—Clean off all surplus glue and glasspaper all surfaces to a fine finish. Apply two coats of white polish and when quite hard wax. (261)

DIGNIFI

Based

Furniture of the late 18th century has a dignity that appeals to many, and many of our better-class furnishing houses are introducing suites of traditional pattern, albeit at some cost. The sideboard in Fig. 1, with its restrained and somewhat slender lines, has been adapted to make it suitable for modern-day needs. It is, in fact, the first item of a suite in mahogany, and has been designed for the average-sized dining-room. The use of knife-cut curl veneers for door panels and drawer fronts would, of course, considerably enhance the finished appearance, but a fiddle-back pattern could be introduced as an alternative. If the selected timbers match fairly well throughout in colour, it could be finished natural with white shellac polish. Otherwise a light stain and garnet polish will give an attractive finish. To those who may be contemplating redecorating the dining-room—and have an eye to the construction of this suite—it is well to bear in mind that mahogany stands well against pale but warm apple-green walls and off-white ceiling and paintwork. Any wallpaper selected to this main colour should have the pattern restricted to the minimum in size and be as unobtrusive as possible

FIG. 1. DELIGHTFUL SIDEBOARD WHICH RECALLS THE DIGNITY OF A LEISURED AGE

Veneered with curl mahogany, this has a rich appearance. It would look well either in natural shade or darkened with bichromate of potash, and finished to an eggshell gloss. Length 4 ft. 6 in., depth 20 in., height over top 3 ft. 1 in.

FIG. 2 (*bottom*) shows an elevation for an alternative sideboard, with square-tapered legs, and is suitable either for mahogany, or, say, pencil-striped veneered walnut doors and drawer fronts, with macassar ebony bandings to the stool rail and toes. It would look quite effective in a dull waxed finish natural colour. The main sizes and proportions have been retained.

Legs.—It would be as well to make a full-sized drawing of the stool portion and shaped ends from the scale elevations and enlarged details shown in Figs. 2 and 4. Thin plywood or cardboard templates of the shaped legs will be an asset if the sawing and shaping is to be done at home. The intention should be to keep the leg and stool rail outlines as slender and graceful as possible, consistent with obtaining maximum strength at the shoulders. Notice also that the front legs (A) carry the mitred shoulders for the corresponding finish of the stool rail, and thus call for additional cutting. It is a point to consider whether end pieces might be glued to the stool rail to take the whole of the shaping (thus keeping all legs identical in outline). They would be carefully cleaned back to the required outline after cramping up. In this case normal shoulders could be employed.

Fig. 4 shows the method of marking the blocks of timber, although, in practice, the face elevation is marked and sawn first. The procedure is repeated for the end elevations that have to be cut to give the effective outline both ways. Begin by shaping all four legs (A and B) by saw, keeping squares of $1\frac{5}{8}$ in. from top to just below the bottom of the doors, and thence tapering away gradually to finish $\frac{7}{8}$ in. square at the toes, the latter to project $\frac{3}{4}$ in. off the vertical. Clean up with spokeshave and scraper. If you propose to veneer the faces of the front legs in keeping with the stool rail, tooth also.

Front and back rails.—It would be nice, of course, to carry the front elevation shaping across the ends, but, as this entails much additional labour, the outside ends (C) are stepped in $\frac{1}{8}$ in. and shaped to give an outline in keeping with the front. They are tongued $\frac{3}{8}$ in. into the legs and should be fretted carefully to outline after trenching $\frac{3}{16}$ in. deep for the carcase bottom as shown in Fig. 3. Groove the stool rail (D) for the tongue of the

D MAHOGANY SIDEBOARD

a well-known model of the late 18th century

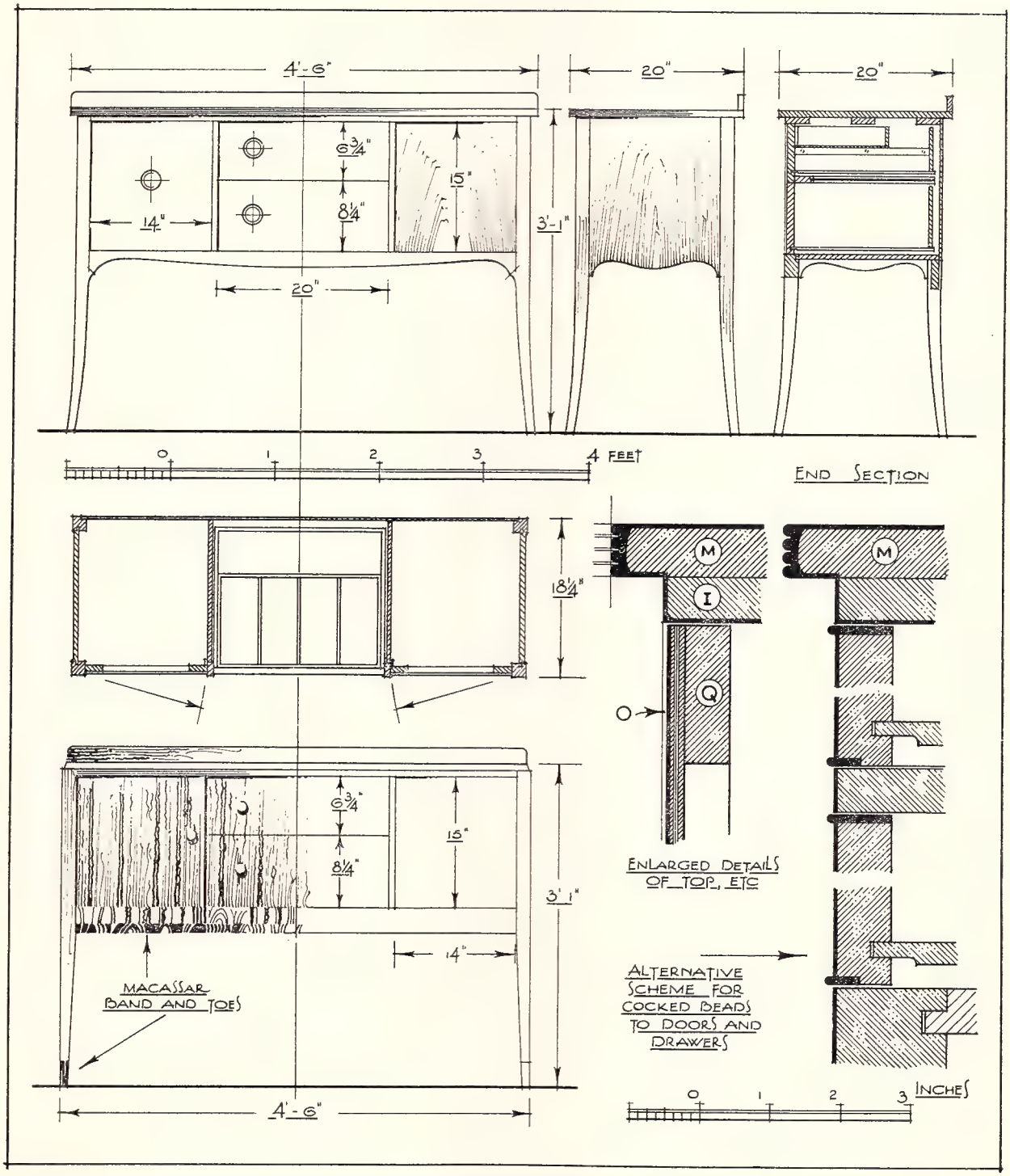

FIG. 2. SCALE ELEVATIONS, SECTIONAL PLAN, ENLARGED DETAILS, AND ELEVATION OF ALTERNATIVE DESIGN

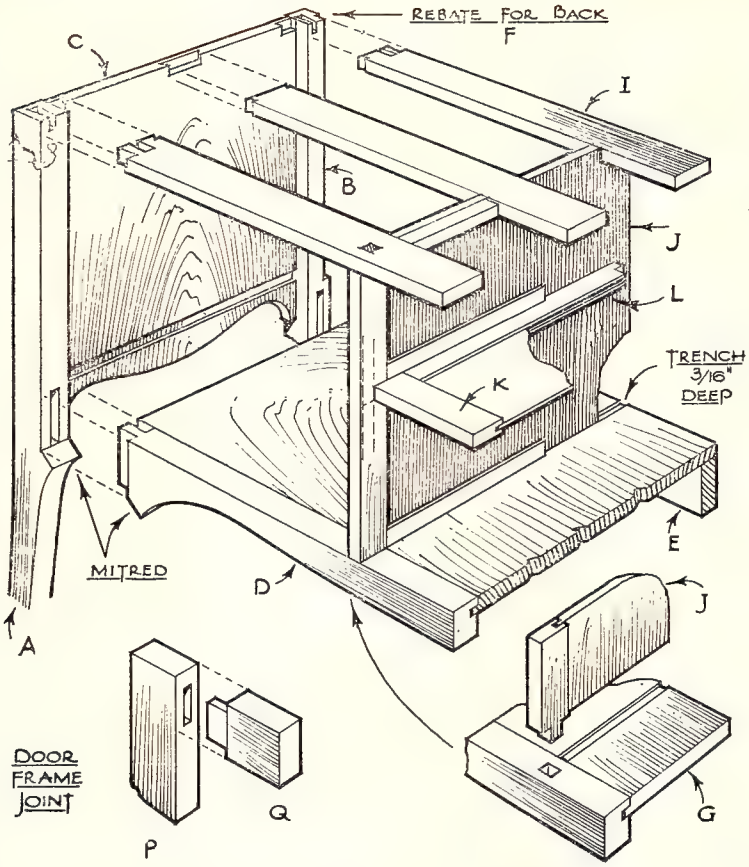

FIG. 3. CUT-AWAY VIEW SHOWING CONSTRUCTION

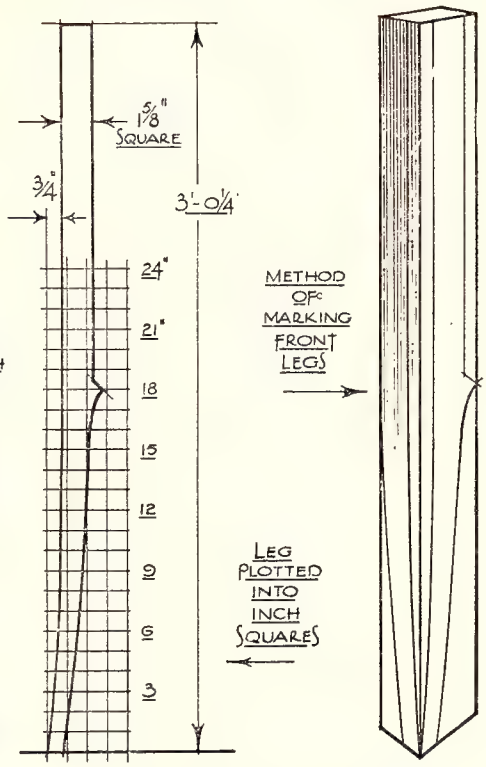

FIG. 4. DETAIL AND SIZES OF LEG

carcase bottom and shape to the required outline. The thickness of this rail equals the leg square. Time and care should be spent upon cutting the mitred joints and mortises and tenons to secure maximum strength at these points. The back stool rail (E) is tenoned straight into the back legs, which might afterwards be rebated for the carcase back (F).

Assemble the carcase bottom (G) to front rail dry and establish the positions of the pilasters (H). These for preference should be stub-tenoned into the lower rail and taken through the top front rail (I). Groove the back edges to take $\frac{3}{8}$ in. tongues, worked on the inside ends (J). The last-named finish flush with the pilasters on the cupboard side, but are $\frac{3}{16}$ in. back on the drawer side. Trench $\frac{3}{16}$ in. deep across the grain of the cupboard bottom for the inside ends.

The top drawer runs down over the drawer rail (K) and runners (L). This is preferable to grooved drawer sides and fillets because of the tendency for this arrangement to drop with wear, thereby cause binding between the separate fronts. After assembling the pilasters and ends chop mortises $\frac{3}{8}$ in. deep for tenons of the drawer rails. It is optional to whether the rail and runners are grooved for a dustboard. Runners are eventually stub-tenoned into the rail, glued at this point only, and slot-screwed dry toward the back. The three carcase top rails are taken straight through, the centre one being dovetailed $\frac{3}{8}$ in. into the outside ends and the others into legs and ends as in Fig. 3.

Assembling.—Glue and cramp the outside ends between the legs, and repeat the procedure with the carcase bottom and stool rail. When dry, glue the two rails and bottom to the ends. Insert the drawer rail, and erect the pilasters and inside ends. Lastly, tap the top rails down. Test the carcase for squareness and freedom from winding and screw the carcase back on all round as a temporary measure.

Top.—The carcase top (M) has a reeded edge front and ends and, although the enlarged details in Fig. 2 show four reeds, by all means employ five of equal width if you feel confident. In point of fact, the finer these are kept the better the appearance. The width of the top will, no doubt, involve at least one joint which might be rubbed or cross-tongued. Select nicely figured stuff. Alternatively, blockboard could be used, lipped front and ends and veneered. The top rim would look nice if veneered with knife-cut contrasting curl. It is screwed up through the top. The carcase top is screwed through the top rails.

Doors and Drawers.—The doors consist of panels (O) glued to frames mortised and tenoned together. The panels might be of $\frac{1}{4}$ in. plywood and any decorative veneers for these should certainly be chosen as a whole with those for the drawer fronts (R and S). The latter should be of mahogany, for preference. The veneering calls for careful toothing and sizing of the groundwork.

Drawer construction follows orthodox lines, the sides lap-dovetailed to the fronts and through-dovetailed to the backs. Slips might be glued and pinned to the sides to take the bottoms, which enter grooves in the fronts and run out under the backs for screwing. Note that the sides to the top drawer are stepped up to run on the concealed drawer rail and runners. Guides (T) should be inserted in the clearances between the inside ends

(*Continued on page* 104)

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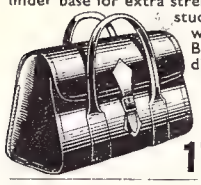

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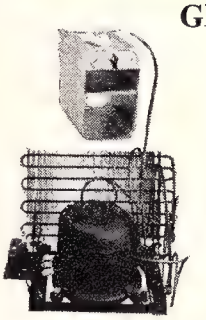

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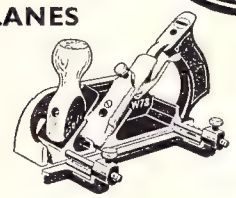

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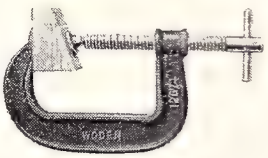

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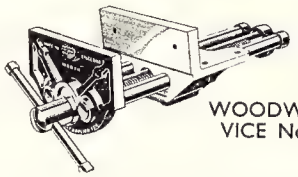

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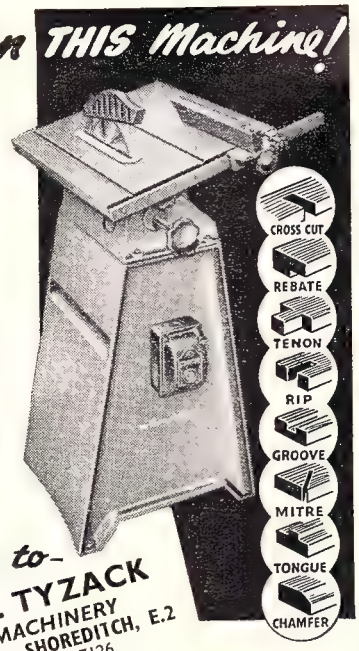

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THE LAW AND THE MACHINE

(Continued from last month)

A MATTER to be considered is the position of visitors to the home who might come into contact with the installed machine and who might be injured by it. In the law there are three main classes of visitors known as Invitees, Licensees, and Trespassers, which last calls for no explanation.

Invitees are usually people on business, such as plumbers, tradesmen, or customers in a shop, and the occupier of the premises must warn them of all unusual dangers of which he knows or ought to know. Licensees are people who come on a social visit, such as friends coming to supper, and they must be warned of all unusual dangers of which the occupier knows. Trespassers have no duty owed to them, but they must not be deliberately hurt.

Warning.—The duties to warn are all concerned with unusual dangers, and, as it is obvious that a woodworking machine is or can be dangerous, it is probable that there is no need to warn visitors of its existence, for it can easily be seen. If, however, there is some defect in a machine which might cause harm to someone using or meddling with it, then it would be safer for the owner to tell his visitor of that danger. However, the majority of visitors would not be expected to touch the machine at all, and if they did so they would be trespassing on the machine, and there is no duty owed to a trespasser. As one judge said : " When you invite a person into your house to use the staircase, you do not invite him to slide down the banisters."

Children.—However, there is one class of visitor which the law does not recognise to be in a separate class, but in fact is, and that visitor is the child. A child may not realise the dangers of a machine, and neither may he appreciate that he was not supposed to touch it, and even if he does realise these things the law still expects him to be disobedient. Warnings that may be sufficient to turn adults from licensees or invitees into trespassers, may not be sufficient for children. For example, many children cannot read, so a warning in writing " Keep Off " would mean nothing to them.

Also the law recognises that many objects are attractive to children, and very often the more dangerous the object the more alluring children find it. Therefore owners of " attractive " machines owe a duty to children to take adequate precautions, such as keeping the room containing those machines locked up.

Example.—It is not difficult to imagine a situation whereby the owner of a machine may be liable to a child in the event of his being injured. Young Johnny and his little brother Jim might come round to tea with their parents, and on arriving see a circular saw in the garden shed buzzing away. Johnny and Jim watch enthralled as the owner demonstrates the machine to their father. Tea is ready, so the machine is shut off and the two adults and Johnny and Jim go indoors. Johnny and Jim will finish tea before everybody else, and they are told to go and play in the garden, but not to go near the circular saw.

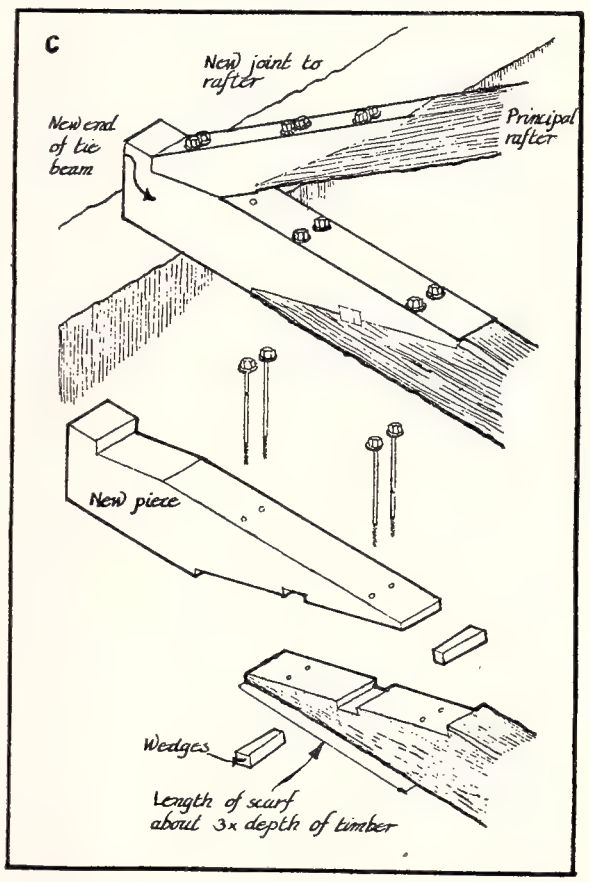
With the best intentions the boys rush away, but after being in the garden a moment or two they see the shed door open and the circular saw inside. They gather at the door and argue about how it works and how one should put the wood in. Argument turns to demonstration, the machine is started (" we really did not mean to ") and Johnny's fingers are gone. The owner would probably be held liable because even though the boys had been told not to go near the saw, it was an irresistible attraction to them and they could scarcely help themselves. If, however, the shed had been locked up, then Johnny would have had to have broken in to get to the machine, and if he had done so then the owner would not be liable in the event of Johnny being injured, as he would have taken full precautions to discourage the child.

This article does not pretend to be a comprehensive guide to all matters affecting installation of electric machines, especially with regard to noise and vibration on which an opinion can only be given on individual cases ; but the law looks upon these matters with the eyes of the average reasonable man, so there is nothing to fear if one acts as such. (259)

Record of the 1955 Annual Convention of the BRITISH WOOD PRESERVING ASSOCIATION

This consists of a series of six papers presented at the convention with the discussions which followed. 1. The Role of Microfungi in the Decomposition of Wood ; 2. The development and use of Naphthenates for Timber Preservation ; 3. Mining Timber and its Preservation ; 4. Pressure Creosoting and the Requirements for Treating Practice ; 5. Recent Developments in the Evaluation of the Permanence and Toxicity of Wood Preservatives ; 6. The Architect and Timber Preservation.

The book is of considerable interest. Of the six papers the last is in some ways the most interesting to our readers since it deals with the practical problems involved. For instance, this illustration shows how the end of a decayed beam which rests on the wall plate can be repaired by splicing on new timber. It is published at 8s. 6d., post free, by the British Wood Preserving Association, 6 Southampton Place, London, W.C.1.



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THE HOUSE LONGHORN BEETLE

By H. A. COX, M.A.

Technical Director, British Wood Preserving Association

In some North European countries this beetle ranks as a most serious pest, being far more common than in Britain and causing extensive damage in buildings. In this country it was distinctly rare until a few years ago and a field entomologist who succeeded in taking a specimen considered himself fortunate. Possibly the marked increase in numbers in some districts of Southern England may be due to the import of larvae or pupae in timber of Continental origin. The accompanying photographs are from the Forest Products Research Laboratory leaflet No. 14, and are by kind permission of the Controller, H.M. Stationery Office

THE House Longhorn Beetle belongs to the family Cerambycidae, formerly often referred to as the Longicornia because of their antennae which are relatively longer than those of other beetles. The scientific name is *Hylotrupes bajulus* and the inclusion of the word "house" in its common name may be a little misleading as formerly it was a forest insect and, indeed, still infests dead branches and stems of pine and some other conifers as well as certain softwood roof and joinery timbers in buildings.

Appearance.—The beetle varies both in size and colour, measuring anything from ⅜ of an inch to twice as long and being of a brown or black tint. The head and the front part of the body are characterised by a heavy coating of grey hairs except for a central line on the upper side of the prothorax and for two shining, black, circular raised portions one on either side. On the wing covers there are four patches of hairs of the same colour in two pairs, but each pair may be joined to form a transverse bar.

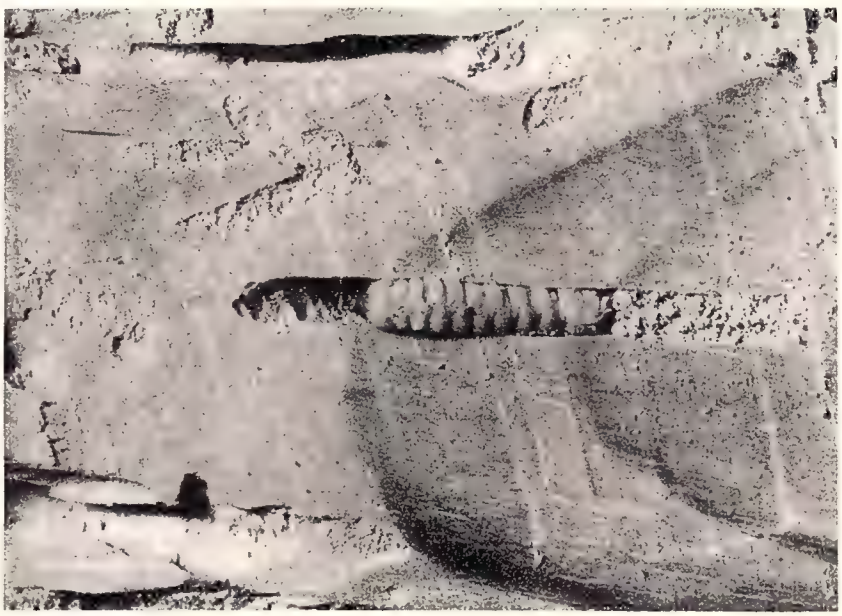

FIG. 1. LARVA OF THE HOUSE LONGHORN BEETLE (x2)

Grubs.—The eggs are laid in cracks or joints and are spindle shaped, and each female may lay up to 200 eggs which hatch after two weeks or more depending on circumstances. The grubs which emerge are white and fleshy and deeply segmented. Of the head only the dark brown jaws can be seen. Feeding begins without delay and continues until full growth is attained. This may require a period of varying duration in different individuals from three or four up to ten or more years. When the grubs are fully grown, by which time they are 1-1¼ in. long, they pupate for a relatively short resting period, following which, generally in one of the summer months, the adult beetle emerges.

Generally the sapwood is the part of a structural member attacked, the borings behind the feeding grubs being packed with frass. The life cycle is of much longer duration in this country than in South Africa for example, where it is said to be completed in one year. Until about a quarter of a century ago the species was virtually unknown as a destructive pest in timber in buildings and was, indeed, generally included among the insects injurious to forest trees, but it seems probable that it has slowly migrated from Southern Europe and at the same time has found conditions in buildings more congenial than those in woodlands. Other species which now infest building timbers and interior woodwork, such as the common furniture beetle and the death watch beetle, have undoubtedly changed their habits in a similar way.

Symptoms.—The external evidence of attack is not easy to detect. The grubs will destroy practically the whole of the sapwood in a joist or rafter, while leaving a skin little thicker than an eggshell intact. There are not numerous flight holes, such as betray the presence of death watch or furniture beetles, but there may be occasional small piles of wood dust and ridges on the surface of the wood over the tunnels made by the larvae. In a roof space where the light may be poor it is often easier to feel these ridges than to see any visible signs of the presence of the beetles. If damage is suspected the timber should be tested by prodding the surface with a knife point or an awl which is usually sufficient to form a hole from which dust will fall if an attack has developed.

Treatment.—In districts where damage to building timbers by the house longhorn beetle has been proved to exist all new timber for building should be adequately

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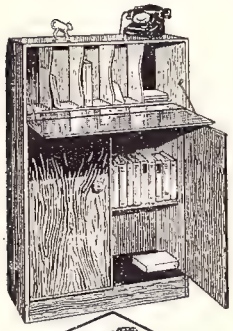

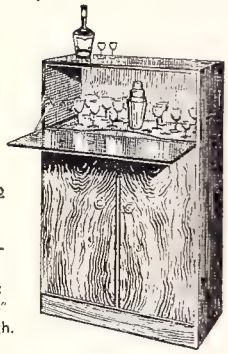

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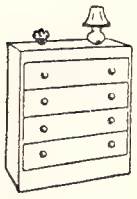

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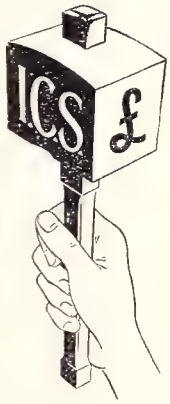

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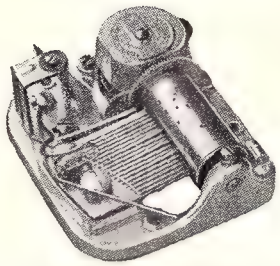

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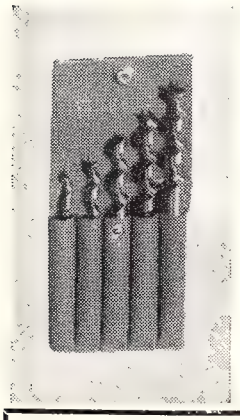

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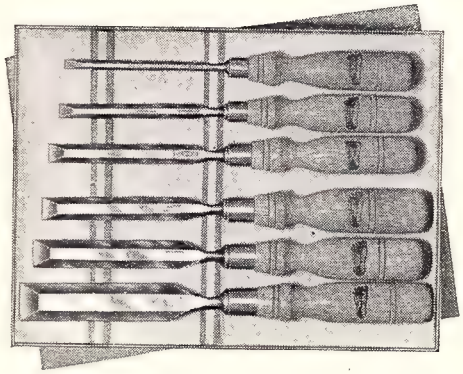

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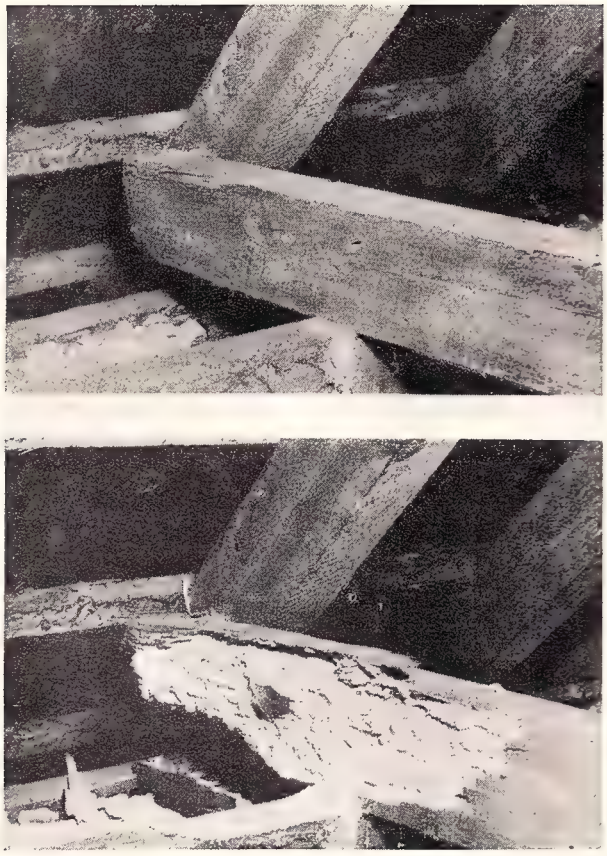

FIG. 2. TIMBERS ATTACKED BY HOUSE LONGHORN BEETLE
(*Top*) shows the roofing timbers before removal of the surface skin. (*Below*) shows the severe structural damage beneath

treated before it is installed. If an attack is discovered in an older building it should be reported to the local authority at once so that measures may be adopted first to exterminate the pest and secondly to check its spread by determining whether other buildings, fences, etc., are infested. If such precautions are neglected serious damage, requiring heavy expenditure for repair work and replacement, may ensue.

Not only may treatment of the timber be necessary but in really serious cases roof coverings will necessarily have to be stripped in order to discover the extent of the damage and how much will need renewing. There are cases on record where whole roofs have collapsed, staircases have become unsafe, and door or window frames have had to be replaced. Fortunately up to the present serious damage in Britain has been confined in the main to restricted areas, especially in Surrey, but from time to time odd beetles are found in other districts. Regular inspections of all timber in buildings will serve to reveal damage by this and other wood destroying beetles before it becomes extensive.

The above facts are published as a warning but should not be taken as implying that the house longhorn is a common pest against which preventive measures should be adopted everywhere. Forewarned is forearmed, however, and the advisability of regular inspections cannot be too strongly emphasised. The Forest Products Research Laboratory, Princes Risborough, Bucks, will supply a copy of a leaflet No. 14 more fully describing the insect and the damage it causes.

The British Wood Preserving Association, 6 Southampton Place, London, W.C.1, also gives free advice on the identification of the beetle and measures to be adopted when damage is located. (260)

CHIPS FROM THE CHISEL

(*Continued from page* 88)

of the material to which it was applied, transforming even humble material like wood into something of unique and intrinsic value: rather it cheapened it and in the fullness of time came to be regarded as a nuisance, a dust trap, till finally it was banished and we reached our present age of bleak functionalism which even glossy finished and brightly coloured fabrics do little to ameliorate.

* * * *

We may comfort ourselves with the reflection that time brings its natural reactions and in due season men's instinct for decoration will ensure its return, albeit in some new form. At present the only true solution for the individual appears to lie with the home woodworker and in the few workshops still turning out handmade furniture. These alone are the people who can so handle their material as to enhance its worth and dignity by using ornament as it was originally used to express their delight in their work. It is a delight which is readily communicated. No one who is the possessor of furniture which is the product of fine craftsmanship is likely to grumble about the trouble involved in looking after it. We all have a natural veneration for the really fine handmade article and can find a pleasure and pride in cherishing it which is in some sort a reflection of the craftsman's own pleasure in his work. To-day these things have the value of uniqueness. Unless we make them ourselves or they are specially made for us, they are very hard to come by and we are not likely to underestimate their worth, or, if we do, it is because we of the modern world are so accustomed to the mere fact of possession that our sense of values is blunted. The machines turn out articles in such profusion that, almost insensibly, we tend to treat them with a certain casualness that would have shocked our great-grandparents, with their high regard for household possessions in an age when they were much less readily acquired than in ours.

* * * *

In this as in most things there is a sensible balance, and the presence of a few finely finished hand-made pieces of furniture in the home will help to preserve it. They are in themselves an incentive to that little extra care and trouble which pay such high dividends in respect of any furniture, whatever its origin. With a little regular polishing, time becomes the friend and not the enemy of furniture, mellowing and preserving and enhancing every good quality of the wood, and helping to give that air of ordered comfort which is such a pleasant part of the personality of a room. A richness of effect lies so often in not acquiring more and more, but in taking care of the things we have, and if among them we can number some fine pieces of furniture which are the work of our own hands and which we can regard with pride and satisfaction, then we are doubly blessed. (263)

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THE QUESTION BOX

Each query must be accompanied by a stamped addressed envelope.
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Queries should be addressed to The Editor, WOODWORKER, Montague House, Russell Square, London, W.C.1.

CEILING LINED WITH HARDBOARD *R.G.R. (Rotherham) has a lath and plaster ceiling in bad condition, and wishes to line it with hardboard, and asks advice.*

Reply.—It is quite possible to line the ceiling with hardboard. Since these boards are made in various grades and qualities we suggest you pick one that is not too hard. This will allow the zinc coated lathing nails to be carefully punched in just below the face so that a distemper coat will practically obliterate them. This method will allow you to get your fixings about 2 in. centres, this being necessary to prevent sagging later on. It also allows any loose plaster to be pulled up to the laths. It is necessary to allow about ¼ in. play at all joints for movement of the material.

Cover the joints with a fillet and fix a cornice fillet. Any break up of the ceiling can then be to your liking. Using 8 ft. by 4 ft. boards we suggest six panels as being a good proportion to keep the ceiling looking as large as possible. The writer has made excellent jobs with insulating boards of ½ in. thickness in this manner, which, when distempered, were beyond reproach. (734)

LIMED OAK RENOVATING *W.N.J.E. (Loughton) has a caravan with limed oak furniture which shows the marks of greasy hands, etc.*

Reply.—The grease may be removed with turpentine or No. 1 white spirit. This will also remove the bleached wax with which we think the oak was finished. Use fresh rags bearing heavily along the grain. Allow to dry. Any dirt marks remaining must be taken out with No. 1F glasspaper wrapped around a cork rubber.

You could make a suitable liming mixture by stirring zinc white powder pigment into natural grain filler until you get a smooth pure white paste. It may be necessary to add a little of equal parts raw linseed and turps. Mix in a teaspoonful of terebene. Allow at least two days to harden thoroughly after application. 2 oz. zinc white and ¼-lb. tin of filler should be ample. Any sort of protection at all is bound to detract in some measure from the pure whiteness of the lime.

1. Use bleached wax very sparingly, rubbing well. Absolute cleanliness in everything concerned is essential.

2. If you are expert with a rubber, seal in with trade quality white polish which is nearly pure white (and therefore almost perfectly transparent). Use the rubber as dry as possible until sealing is complete.

Reliming is about the most time-consuming job in refinishing. After stripping it may be necessary to wire brush the surface to get the bulk of the lime out of the pores. It may or may not come out easily depending on what it is. If there is difficulty it might pay you to change to a natural french polished finish. Use the normal technique after stripping and papering. (87)

ROOF FOR PORTABLE AVIARY *T.H.W. (Peckham) asks advice on the timbers to use for the roof of a portable aviary. The top rails are of 2 in. by 1 in. stuff.*

Reply.—The section of the carcase top rails, 2 in. and 1 in. is sufficient to obtain a fixing with ordinary wood screws up through the rails into the frames of the roof sections, and this is the method we should advise. Another method would be to use metal angle brackets secured to walls and roof. These might provide more elbow room for manipulating the screwdriver. The usual weakness met with in this type of structure is the juncture between the carcase top rails and the corner posts, but if each side is made up complete with the posts and rails halved together and the frames erected by bolting the sections together, this difficulty is usually overcome.

If you are doubtful about the roof dimensions not fitting the carcase it is quite permissible to line up with fillets screwed to the carcase to correct. If these fillets are firmly secured a good fixing is provided for the roof. Use brass screws if possible. If iron ones are used well grease them before fixing otherwise trouble will be experienced in removing them when dismantling the job on future occasions. (733)

FINISHING CEDAR *L.C.W. (Holt) asks the method of finishing cedar.*

Reply.—Western Cedar, unlike the Eastern variety, does not always look best unstained. Judge whether or not staining is required on the quality of the material. A naphtha mid-oak stain would be most suitable but water stain may also be used. For a natural finish on cedar, white polish is required. Tint it slightly with a pinch of Bismarck brown dissolved in a little methylated spirit and mixed in.

Lebanon cedar is whiter than the commercial cedars. For a sentimental reason we think that a natural finish is the most fitting, using white polish tinted slightly as above. It may, however, be stained. A preliminary coat of hot, clear, glue size—a teaspoonful to the ½ pint of water—will reduce the absorption which can be considerable. This applies also to Western cedar. The fragrant odour from these cedars is best prolonged by completely french polishing exteriors. Interiors should not be finished in any way.

Filling is required in all cases. It would be a good plan to obtain a natural filler of the prepared type. This could be coloured with raw umber to suit teak and stained cedar, or burnt sienna for natural cedar. The routine should be: Size if necessary. When dry cut smooth. Stain if necessary and apply one thin coat of the appropriate polish. Fill the grain and fad lightly. If at this stage you think toning is required apply a thin uniform coat of polish coloured with a pinch of burnt sienna or raw umber to suit cedar or teak respectively. Thereafter body and finish. (184)

RENOVATING SCRATCHED FURNITURE *K.D. (Hull) has a badly scratched sideboard. He is uncertain whether the finish is cellulose or french polish. He asks how to deal with it.*

Reply.—Identify the finish by scraping a hidden area firmly with a sharp knife or chisel. Light dust will be removed if the varnish is cellulose, or a thin shaving which breaks up at a touch if the finish is french polish. Cellulose is most difficult to touch up well, the usual procedure being to strip. You could make a satisfactory job as follows: Use No. 00 glasspaper smeared with white oil or raw linseed oil. Work carefully along the grain cutting the scratches flat as near as possible but being very careful not to cut through the film. Clean off with benzine. Apply single thin coats of clear brushing cellulose at one hour intervals—clear nail varnish would do—to the remaining scratches. Use a pencil brush, the aim being to level up. Next day flat carefully as before, clean off with benzine, and repeat if necessary. The dull areas could be restored with a french polishing rubber used with straight strokes, or you could use a cellulose reviver such as Gold Seal Supersol.

It is easier with french polish to smooth the whole surface with fine steel wool and level up scratches with thin coats of polish. Two or three days later flat carefully with fine paper used dry. Use the rubber to get the surface "working" and finish by spiriting off or stiffing and burnishing.

If you cannot do the above partial concealment may be effected by the house-wife's method of filling the cracks with the meat of an oily nut such as Brazil nut and then using furniture cream. For a small job like this the simplest method is to wash it off with methylated spirit. Use a coarse rag. Concentrate on one area at a time. Finish with No. 1 glasspaper after which the job may be stained to suit. (210)

REPLIES TO READERS' QUERIES

PAINTING OVER FRENCH-POLISHED PAINTWORK *E.J.B. (Ipswich): "I have a panelled room which has been undercoated and grained and finished with french polish rather than varnish. Is it possible to undercoat for graining without removing the french polish?"*

Reply.—When painted work is coated with french polish, the surface usually crazes all over, due to the variation in the co-efficient of expansion. Provided there is no such crazing there seems no reason why you should not paint over it after the usual washing and rinsing. If the work has been french polished, there is a distinct possibility that it has also been treated with a wax polish or furniture cream. Nothing will adhere to such a surface and if there is the slightest doubt the whole should be washed with a solution of soda or detergent—not forgetting to rinse well in several relays of clean water. If the surface is crazed you should remove it with a strong solution and scrub and rinse off as soon as it is softened. (117)

RESTORING JAPANESE PICTURE *F.D.B.G. (Edinburgh) writes: "I have a Japanese picture on wood. The background is a black lacquered surface with raised design. The design is in ivory and mother of pearl. It seems to have been polished with various types of polish, and the result is a patchy and sticky appearance. Furniture cream doesn't seem to give an even polish all over, but this may be due to the past treatment. I have washed the surface with water and detergent and dried with a chamois cloth. This has resulted in a dull surface with streaks on part of the surface. Can you advise a suitable treatment?"*

Reply.—This is a problem which has never—in our experience—before presented itself. The more or less unknown nature of the lacquer used makes any treatment somewhat hazardous. It is thought that the ancient art of lacquering, as practiced by the far eastern people, included the use of an exudation from what was called the "Varnish Tree", and that this source has some relation to the commodity known as "Tung oil" which is used extensively in the lacquer trade.

Before any attempt is made to re-burnish the picture, or to apply any coating, we feel you should establish whether the streaks you mention are caused by deeper cleaning due to the prolonged action of the detergent in those particular spots, or the partial removal of the top coat—assuming that there is a top coat and that it is thin enough to be so affected. A finger tip in *mild* detergent water should determine this. Whatever is done eventually the whole should be brought to an even, clean condition and thoroughly rinsed.

There are two courses open to you, (A) re-burnish, and (B) re-lacquer. Try out a small patch in one corner by rubbing with a little metal polish and finish with a brisk rub with a liquid car polish; the metal polish might be sufficient in itself. If this seems to respond try *Nu-Finishes* burnishing cream and gloss reviver. You will probably need a tooth brush to help with the rag to get into the hollows. This process polishes what there is there and leaves nothing on the surface.

If you get no response to your trial patch we can only suggest that you apply a coat or two of spirit lacquer by spray or synthetic lacquer by brushing; both should be done in a warm, dry atmosphere; if spraying, the air must be well ventilated and there must be no naked lights. (169)

NEW PARQUET FLOOR *G.A. (Sutton-in-Ashfield): "We are moving into a new house with normal softwood floors, and would like to lay 9 in. square plywood. Can you advise us?"*

Reply.—All floors in new houses are damp so wait until the joints show signs of opening. This will indicate the state of the floors. The material you mention is often used, but it must be remembered that plywood is only veneer thick so far as top wear is concerned and this will mean renewals at the wearing points such as doorways. For this reason pinning only can be considered.

Basket pattern in 9 in. squares will be very nice in appearance. For laying all non-wearing sections we prefer to use scotch glue and panel pins. As far as possible glue the edges when laying but wipe off all surplus glue with a damp swab as you proceed. This will raise the grain and at the same time make the sanding off much easier. For finishing give a coat of french polish, lightly rubbing down when dry. Ordinary beeswax applied thinly will keep the floors in good condition and be reasonably free from slipping if not overdone. (183)

DARKENING MAHOGANY *N.H. (Streatham) has made a cupboard with mahogany-faced plywood. He has filled the grain and given six coats of french polish. It is not dark enough, and he asks advice.*

Reply.—The first step should have been to bring to a shade of brown-red slightly lighter than that required using oak stain. It will be necessary now to match up using pigmented or coloured polish. Start by rubbing the surfaces matt, using fine paper or No. 2 steel wool. Work along the grain. Be careful at edges and remove dust.

Mix a quarter teaspoonful of raw umber in about one third of a cupful of 50/50 button polish (enough to coat the job two or three times). Apply one thin coat. Allow one hour's hardening time and then consider the effect. It may be necessary to intensify the colouring action by getting oak spirit stain and mixing in a half teaspoonful for the next coat. Try to get the job to shade with a maximum of three coats. Allow adequate hardening time between each and work quickly or there is a risk of lifting the first coat in patches. A little evening up may be necessary in the last coat. Allow one day and then finish in the usual way to give adequate protection to the colouring. (89)

WATER MARKS ON WAX *J.G.R. (Brierley Hill): "An oak table with wax finish has some unsightly marks due to water having been spilt on it. Can you advise me how to deal with it.*

Reply.—The water would tend to form an emulsion with the wax by absorption. Try a hot soft duster over the areas several times. Keep moving up and down the grain. If this fails the only cure is to strip the areas concerned with a rag and real turpentine and when dry to rewax. (206)

SHOULD LADDERS BE PAINTED? *M.S. (Gateshead) has a new extension ladder. Some have advised him to paint only the strings; others tell him not to paint at all.*

Reply.—Generally, ladders should be painted; one has only to note that such people as builders and window cleaners invariably paint their ladders to realise that there must be some good reason for it; obviously the reason is to protect them from the weather. It is most important that the joints of the rungs and strings are protected from the entry of moisture; and the only way is frequent painting. All the defective and dangerous ladders which the writer has seen have been chiefly so conditioned by the neglect of this precaution. This was most evident in extension ladders; when the wedges become wet they swell, get loose, and work out, rendering the ladder dangerously unfit for service.

In the case of pole ladders, some builders paint all except the centre of the rungs; but there is little virtue in this because one can paint the whole rung as quickly as one can cut round in a line at both ends. One of the most valuable features of ladder painting is that it affords an opportunity for thorough examination and any necessary repairs or adjustments. Although a private person, using the ladder only at intervals and in favourable weather at that, might feel that a coat of creosote would suffice, I would say on the whole that all ladders should be painted. (121)

FINISHING TEAK *L.C.W. (Holt) asks whether any special precautions have to be taken when finishing teak.*

Reply.—Teak is inclined to reject finishes and so as a precaution it should first be washed with Naphtha or white spirit to remove surface oil. Teak is best unstained. A common finish for it is linseed only with 5 per cent terebene. It is not necessary to use linseed oil when french polishing teak. Button (light brown) polish should be used. (184)

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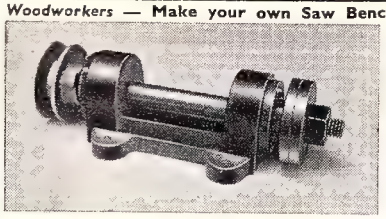

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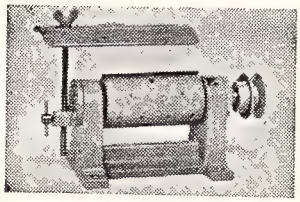

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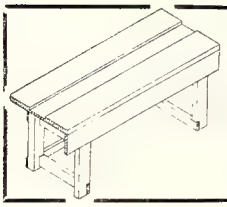

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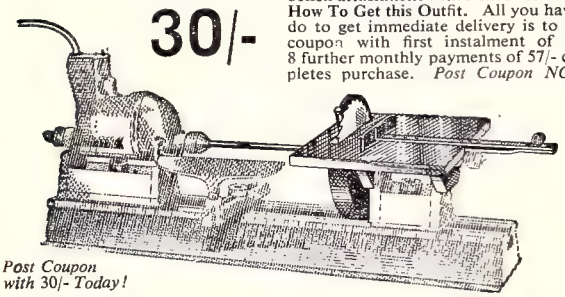

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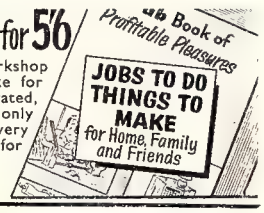

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IN THE POLISHING SHOP

(*Continued from page* 89)

The oil is removed from the film by being absorbed into the rubber as this dries out. The covering cloth must be soft or the surface produced will be striated. We favour velvet.

Add 50% meth. to the polish, dip up and oil up as required. Cover the surface in loops and then figures of eight to get it " working." For the stiffing check that the rubber face is tight and unwrinkled. Glide on in from one end and off and up at the other. Reverse the movement overlapping slightly. Cover the surface and repeat. As the rubber dries out increase the pressure. The tendency then is to move the rubber slowly, but it must never stop. Any fumbling, hesitancy, or uncertainty will result in a rubber mark but this can be stiffed out along with any others. The essential things are to work in straight strokes, to have a covering cloth which will leave no track and to have complete control of the rubber. Stiffing is a fast, handy method which every polisher must master.

Spiriting off.—In this method the film is made bright and smooth by partly dissolving and burnishing its surface. The oil is lifted by absorption into the spirit rubber. Start off as for stiffing with a suitably covered rubber and 50/50 polish and spirit to get the surface working The spirit rubber, a special one kept in its own jar, should be covered with two layers of mutton cloth. It is charged with a little spirit only before being stored so that when required it is only slightly damp and more or less saturated with spirit vapour. It must not be possible to squeeze out spirit. A wet spirit rubber will bite quickly and may ruin the work. Use light, fast strokes. Start with large loops and then figures-of-eight and then straight strokes. Do not persist on one part of the surface.

The essentials of this method are to have a soft, track-free covering cloth, light, fast rubber movements, and never to use the spirit rubber while wet with spirit or immediately after more spirit is added.

The Acid Finish.—In this method the surface is hardened quickly by the action of the acid which is to separate the spirit and shellac. The process of rubbing on the acid also lifts the oil from the varnish film. The chalk neutralises any acid remaining and absorbs the oil which is then removed with the chalk dust. The approach to this finish is the same as for the last two. Get the surface working with 50/50 and a suitable rubber. Use enough oil but keep this to the minimum required for easy handling. The aim at this stage is to get the surface flawless.

When satisfied, wet a soft rag in the acid which is a 10 per cent solution of sulphuric and water. Rub this over the surface. It will tend to go on in beads and globules and the film will become quite dull. If you rub one such bead with your finger the oil beneath will be released and will float to the top where the rainbow colours can be clearly seen if you get your eye in the right position.

The aim now is to get the acid through the oil film. See that your palms are clean and dry. Rub the surface over with them firmly and speedily using loops and straight strokes. Most polishers use one hand only. The friction will increase as the oil is lifted. Now use Vienna chalk or precipitated chalk. This must be borne dry. Keep it in a warm place as it picks up dampness readily. Sprinkle it over the work with a pounce bag (B) which must have a texture such that it lets the chalk through while retaining any tiny lumps or grit. Dry the hands and repeat the rubbing action until the surface looks and feels dry. The friction then will be considerable. Now use a fine rag along the grain to remove chalk remaining. This will have lost its whiteness.

It is essential in this method to have a perfectly bodied base with no trace whatsoever of sinkage into the pores : the chalk must be bone dry ; the hands must be clean and free from dampness or sweat. Sweaty palms can be wiped with spirit and then dried on a towel.

Bear in mind that these methods of finishing cannot make up for poor bodying. A flat adequate body is essential for successful finishing.

Dos and Don'ts

Do, if you are a beginner, let the job stand for half an hour or so after getting the surface working and mark free in the spiriting and acid methods. This will reduce considerably the risk of failure.

Do try all methods of finishing. You will, like most polishers, get to favour particular ones.

Do realise that the choice of finish is often governed by the nature of the construction.

Do position yourself so that you can watch the surface carefully during finishing.

Do appreciate that an adequate body is essential for any method of finishing.

Do remove any nibs, pimples, etc. from the surface before starting the finishing process. Fine steel wool, used dry, is suitable.

Don't add water to the acid when preparing the acid mixture but always the reverse, drop by drop. These two have a high affinity or attraction for each other. The heat generated by sudden mixing could change the water to steam with risk of accident.

Don't work blindly. Success can only come when the reason for each move in the processes is clearly understood. (257)

CHAIR MAKING

(*Continued from page* 91)

slats, but first plane the board to thickness. One cut only should be made for the concave side of one and the convex side of the next. Any slight variation in the shape will be easily corrected with the spokeshave when cleaning up.

When cutting the back legs use a handsaw where possible. From the top end to the seat is obviously a straight cut, and from the bottom quite a long straight cut may be made before resorting to a bow-saw at the centre. The top and slats will have to be cut with a bow-saw. If an angled cut is to be attempted mark the angle on the end grain as a starting guide and make frequent checks with a bevelled block between the face of the timber and the saw blade.

When all cutting out is completed plane and mark face and face edge of all straight parts, gauge to width and thickness and bring to size. The slats and top must be cleaned up to template using spokeshave or compass plane. The back legs, which have to be recut to the front shape, should be paired up and the insides marked. Shoot this side if not already done and line up the front of the legs to the template. (266)

(*To be continued*)

HOW TO MAKE A

XYLOPHONE

This has become an extremely popular instrument in recent years, and the work of making it is most interesting. The example in Fig. 1 consists of 27 notes, ranging from G to A. If carefully made of suitable wood a perfectly practical instrument is possible with good tone. There is nothing difficult about the work, though a good ear is needed for tuning. We are greatly indebted to Messrs. Boosey & Hawkes Ltd., manufacturers of musical instruments, for much of the information in this article

EASILY the best wood for the keys is Honduras rosewood. This has a ring about it that no other wood seems to possess. It may, however, be difficult to obtain, and it is then a case of falling back upon a timber of comparable weight and quality. The instrument in Fig. 1 has notes of purple heart, which gives quite good results but has not the quality of rosewood. Readers may like to experiment with other timbers which they can get. Honduras rosewood has a weight of about 60 lb. per cubic foot, and anything much lighter than this is not likely to be so successful. The following are the weights of timber of a similar class: Satinwood 59-64 lb., Cocus 74 lb., boxwood 54-70 lb. Any of these would be worth experimenting with, though we can only repeat that professional makers have never found a timber to equal Honduras rosewood.

The stand can be made of any straight-grained timber. That in Fig. 1 is of Parana pine. The converging members fit into notches cut in the three cross pieces and are held with screws driven in from beneath. Strips of felt glued to the top edges provide a suitable bed for the keys to rest on.

Stand.—Sizes of this are given in Fig. 2. It is a help to set out the whole thing on a sheet of brown paper or plywood as this gives the exact angles at which the various grooves are cut. Note that of the four members on which the keys rest (A, B, C, and D), only (C) requires a square groove. The grooves for all the others are at an angle, all varying.

Plane up the four pieces (A, B, C, and D), to finish about $\frac{3}{8}$ in. thick. Those which support the accidentals (A and B) are $1\frac{1}{4}$ in. wide, the others (C and D) $\frac{5}{8}$ in. wide. In this way the accidentals stand up above the others.

By placing the cross-pieces (E, F, and G), on the full-size drawing the exact positions of the grooves can be marked; also the angles. Note that each set of notches is at the same angle. Thus all those to hold piece (A) are at the same angle; and so on.

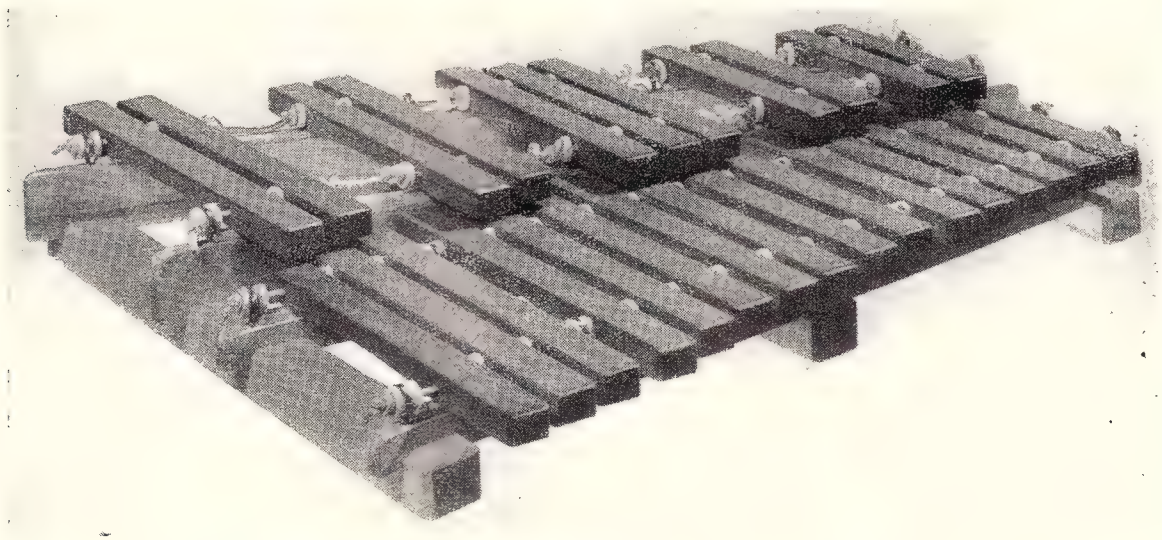

FIG. 1. COMPLETED INSTRUMENT FOR PLAYING ON A TABLE OR FOR FIXING TO A STAND
It has a range of over two octaves. Middle C is the fourth note from the left in the front row

The grooves being cut with saw and chisel, all the grooves in the cross-pieces are drilled for the screws. The latter should be of fine gauge so that they do not split the thin wood, and for the same reason the thread holes should be bored to the full depth.

Any of the usual finishes can be used for the stand—french polish, varnish, or cellulose. It is a help to apply this when the parts are separate and to assemble later.

To hold the cords on which the notes are threaded screw eyes are driven in in the positions shown in Fig. 3. Strips of felt are glued between these, any varnish or polish being scraped away beforehand. Felt can sometimes be obtained in strips, but it may have to be cut from a wide sheet.

Keys.—All of them are $\frac{3}{4}$ in. wide by $\frac{1}{2}$ in. thick. The length varies according to the note; the shorter it is the higher the note. The sizes in Fig. 3 can be followed, though it should be realised that each has to be tuned afterwards. Plane up the wood in strips and

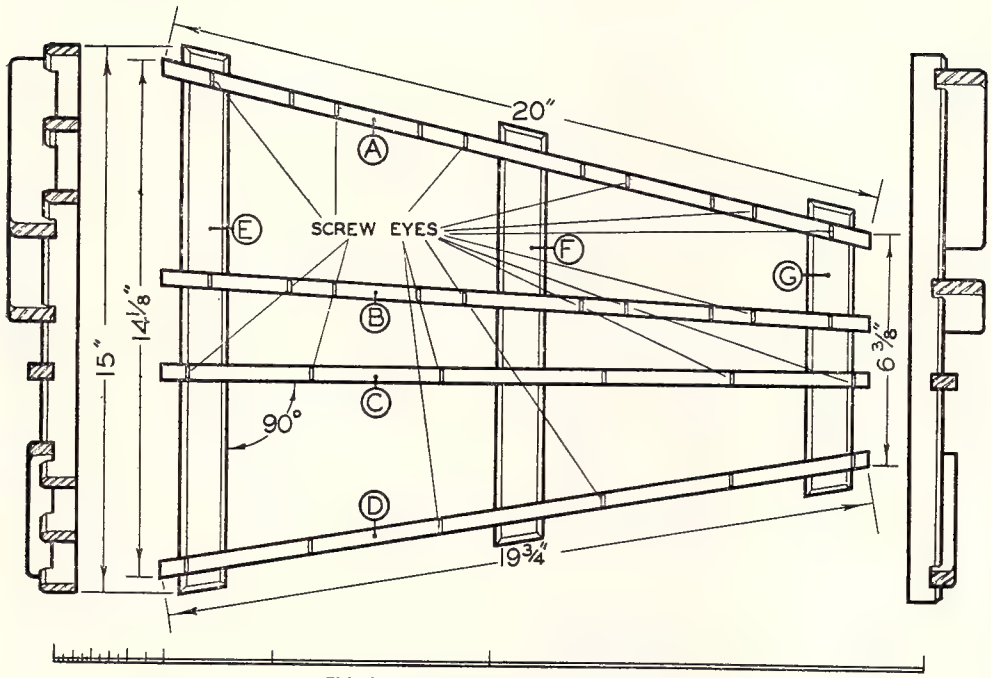

FIG. 2. CONSTRUCTION OF FRAME
Note that only the member (C) is at right angles with the cross pieces (E), (F) and (G).

cross-cut to the lengths given. Mark on the back of each the note it is supposed to be—A, C sharp, and so on.

Each has to be drilled in two places to take the cord, and there are ideally exact positions known as the focal points for the holes. The latter should certainly approximate to these, though anything like micrometer accuracy is quite unnecessary. A variation of as much as $\frac{1}{8}$ in. or so does not affect the note much. If the positions in Fig. 3 are followed they will not be greatly out.

These focal points represent positions in the keys where there is practically no vibration. When a key is struck it vibrates as shown in great exaggeration by the curved lines (A), Fig. 4. The points where the curves cross each other are the focal points. You can test this for yourself by putting some fine dust on a key as at (B), Fig. 4, and striking with the hammer. The dust will tend to concentrate in the region of the focal points as at (C). The effect is more noticeable in a metal key than in a wood one.

Tuning.—Having drilled the holes—noting that, except those opposite strip (C), they are at an angle which follows the slope of the pieces (A, B, C, D)—the edges and corners are rounded and finished with glasspaper.

If a test is now made all the notes will appear sharp, possibly by a tone or even two tones. To lower the note reverse it and take shavings from the middle with a spokeshave as in Fig. 5. The amount to be removed can soon be ascertained by trial and error. Tuning against a piano is the simplest method. If by any chance too much is removed so that the note is flat it can be corrected by taking shavings from the end of the note to reduce its length. This, however, should be unnecessary.

An alternative to flattening the note by shavings is to make a saw cut across the lower surface as at (A), Fig. 5. When tuning is completed give the keys a coat of clear varnish or clear cellulose. Each is marked with the note it represents. Paint on the marks at the ends where they are not normally struck with the beaters.

Fitting up.—Tie a knot at one end of a length of cord and thread a felt washer on to it. Pass it through the end screw eye, put on another washer, and thread on the first note. Continue the process until the next screw eye is reached. In the case of the accidentals it is necessary to tie knots in the cord so that there are wide spaces between B♭ and C♯, E♭ and F♯.

Beaters.—These can be spheres of boxwood or hard rubber about $\frac{7}{8}$ in. diameter mounted on cane handles.

(164)

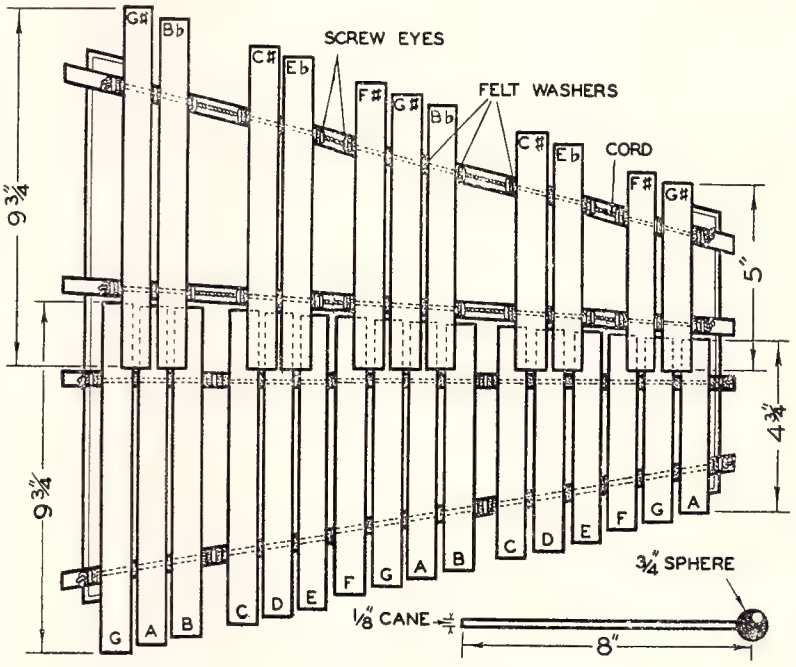

FIG. 3. POSITION OF KEYS ON THE FRAMEWORK
They are not fixed tightly. The cord with spacing washers holds them in place

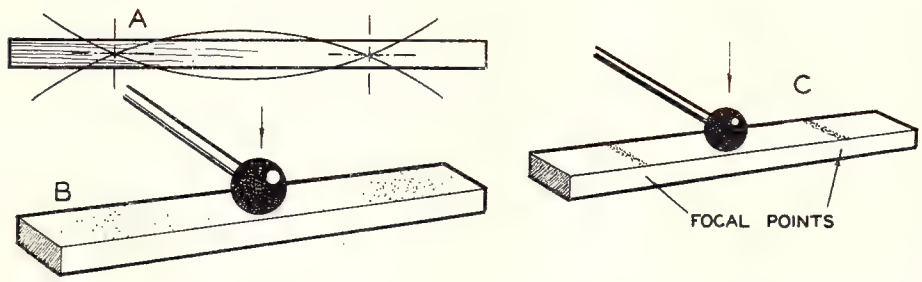

FIG. 4. HOW THE FOCAL POINTS CAN BE FOUND

There is no need to test each note in this way if the sizes in Fig. 3 are followed, but when drilling the holes some slight variation is permissible to enable the keys to be placed in alignment on the frame.

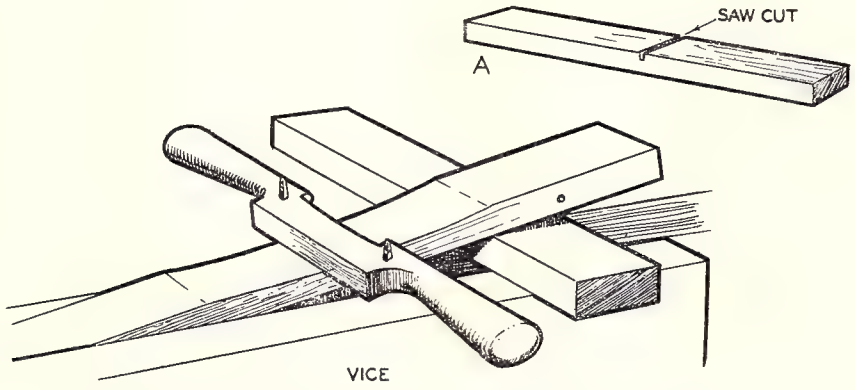

FIG. 5. TRIMMING THE NOTE FOR CORRECT PITCH

Hollowing the underside has the effect of flattening the note. Trimming the ends sharpens it.

SIDEBOARD (*Continued from page* 96)

and drawer sides. Glue these only at the front and use pins toward the back. Kickers (U) must be introduced between the top rails as in Fig. 3.

The design shows both doors and drawers set in $\frac{1}{8}$ in. inside the carcase members (and for which appropriate stops will be required), but another refinement is to add fine cocked beads as in Fig. 2 to the edges of doors and drawers. This, however, means bringing the drawer rail through to the front between the drawers, with appropriate alteration to sizes of drawers and cutting list.

Another feature worth consideration is the introduction of a sliding cutlery tray to the top drawer, consisting of sides, front, and back of $\frac{5}{16}$ in. material, and thin plywood bottom, as in Fig. 2. The tray might be roughly half the depth of the drawer and suspended on fillets screwed to the drawer sides.

Select good reproduction ring handles, of 2 in. or $2\frac{1}{4}$ in. diameter, for the doors and drawers. Choose good ones because they form quite a feature in the finished appearance. Hinges, ball catch, and small cupboard locks complete the requirements for the doors. A till lock might be added to the top drawer.

Alternative designs.—With the alternative design shown in elevation in Fig. 2, it will be noticed that the carcase size becomes 4 ft. 6 in. because of a receding and bevelled-edge top, but the general dimensions remain constant. The legs, $1\frac{5}{8}$ in. square, have a vertical line to the outside and are tapered to the toes from immediately below the stool rail. The construction is identical with the mahogany sideboard, but make due allowance in the cutting list for increased lengths, etc. Although walnut and macassar veneers have been mentioned, the design will lend itself to any variety or combination of timbers. An alternative is construction in beech or birch for enamelling to one of the pastel shades for harmonising with a colour scheme. Parana pine could also be used for this.

CUTTING LIST—MAHOGANY SIDEBOARD

	Long ft.	Long in.	Wide in.	Thick in.
(A) 2 Front legs	3	1	$3\frac{1}{4}$	$2\frac{3}{8}$
(B) 2 Back legs	3	1	$2\frac{5}{8}$	$2\frac{3}{8}$
(C) 2 Outside ends	1	7	16	$\frac{5}{8}$
(D) 1 Stool rail	4	5	3	$1\frac{5}{8}$
(E) 1 Stool rail	4	5	$3\frac{1}{4}$	$\frac{7}{8}$
(F) 1 Carcase back	4	3	$16\frac{1}{2}$	$\frac{1}{4}$
(G) 1 Carcase bottom	4	4	17	$\frac{5}{8}$
(H) 2 Pilasters	1	$4\frac{3}{4}$	$1\frac{7}{8}$	$\frac{5}{8}$
(I) 3 Top rails	4	$4\frac{1}{2}$	3	$\frac{5}{8}$
(J) 2 Inside ends	1	$4\frac{1}{4}$	17	$\frac{7}{16}$
(K) 1 Drawer rail	1	9	$2\frac{1}{2}$	$\frac{5}{8}$
(L) 2 Drawer runners	1	3	$1\frac{3}{4}$	$\frac{5}{8}$
(M) 1 Top	4	$6\frac{1}{2}$	$20\frac{1}{4}$	$\frac{3}{4}$
(N) 1 Top rim	4	$6\frac{1}{2}$	2	$\frac{9}{16}$
(O) 2 Door panels	1	$3\frac{1}{2}$	$14\frac{1}{4}$	$\frac{1}{4}$
(P) 4 Door stiles	1	4	$2\frac{1}{4}$	$\frac{5}{8}$
(Q) 4 Door rails	1	$1\frac{1}{2}$	$2\frac{1}{4}$	$\frac{5}{8}$
(R) 1 Drawer front	1	$8\frac{1}{2}$	7	$\frac{13}{16}$
(S) 1 Drawer front	1	$8\frac{1}{2}$	$8\frac{1}{2}$	$\frac{13}{16}$
(T) 4 Drawer guides		$9\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{16}$
(U) 2 Drawer kickers		5	$1\frac{1}{4}$	$\frac{5}{8}$

Working allowance has been made in lengths and widths. Thicknesses are net. Preferably mahogany should be selected for items A, B, C, D, H, one of I, M, N, P, Q, R, and S. The back stool rail, two of the top rails, drawer rail, runners, guides, and kickers may be of pine. The carcase bottom and inside ends can be stained and any suitable timber might be used. Plywood should be first choice for the door panels, carcase back, and drawer bottoms. Nominal $\frac{1}{2}$ in. timber, preferably one of the mahogany varieties, will finish about $\frac{7}{16}$ in. for the drawer sides and backs. These are extra. (265)

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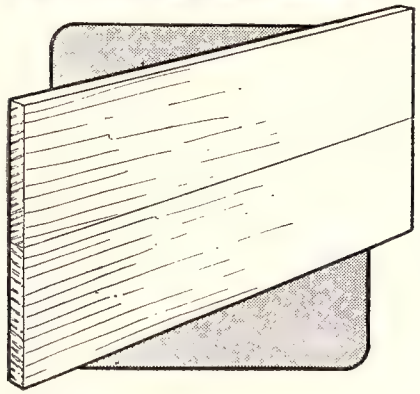
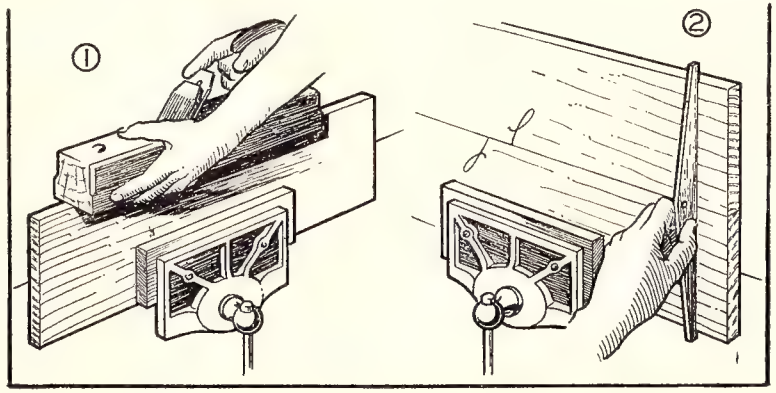
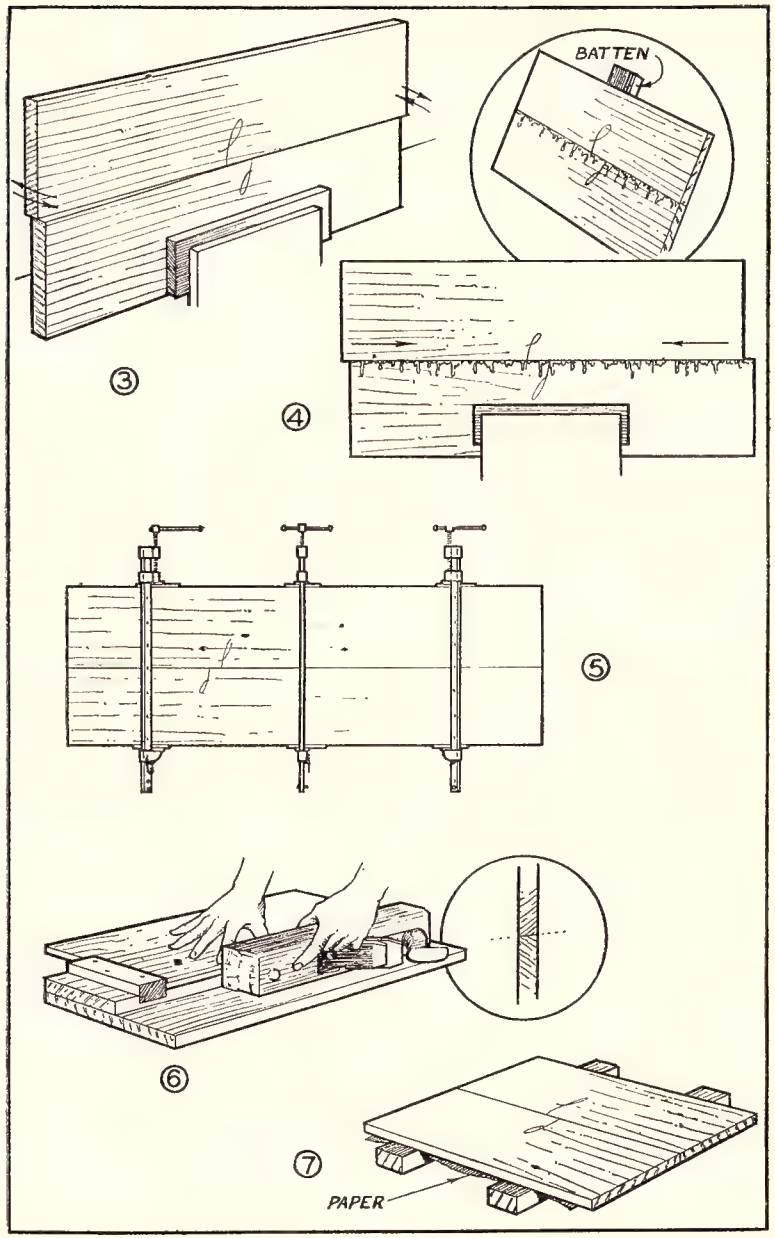


THE RUBBED JOINT

This joint is used when a broad unbroken surface is required and if well made is extremely strong and reliable. When planing ensure that the blade is sharp and finely set

1. Mark edges to be joined and fix one piece in vice. Grip plane as shown with fingers of left hand acting as a fence. Plane centre until plane ceases to remove shavings then take shavings throughout the length. Test for squareness. Prepare other piece in the same way.
2. Check for alignment with straight-edge.
3. Test for roundness. A round joint must be avoided and can be detected if the joint swivels easily.
4. Without burning, heat joining surfaces. Fix one piece in vice and place the other alongside so that the edges to be joined are touching. Apply glue. Place top piece in position, and, pressing downward, rub back and forth. Do not break the joint. Support whole width against a batten until set.
5. Long joints are shot slightly hollow and are cramped after rubbing.
6. To prevent plane from wobbling, joints in thin wood are shot on a shooting board. Shoot one with face mark upwards the other downwards This ensures that the boards will still be in alignment if edges are not square.
7. Thin wood is assembled by placing on battens covered with newspaper and rubbing together. The battens serve as supports, and the newspaper prevents the wood sticking to them. (268)





BRITAIN'S ANCIENT YEWS

YEWS are particularly associated with the early church in Britain, and there survive to this day veteran yews of almost incredible age—some are reputed to have stood since the days of the Druids—in many churchyards and parks where they are protected.

"A post of yew will outlast a post of iron." So the old country saying runs, and none who have stood and gazed at the sombre majesty of some gnarled yew in a village churchyard would feel inclined to deny the truth of the legends which are told of its ancient lineage.

The venerable yew standing at Fortingall, near Kenmore, at the extremity of Loch Tay, is reputed to be the oldest tree in Britain. Pennant, writing in 1772, stated its girth to be 56 ft., and De Candolle, writing in the early part of last century, pronounced it to be the "oldest authentic specimen of vegetation in Europe," and estimated its age at from 25 to 30 centuries.

This veteran has now got even beyond the stage of mere hollowness, and most of the outside shell has disappeared, only two portions of it, at about opposite sides of the tree, remaining. These are now so far apart as to look like separate trees with strange flattened trunks, the inner portions of which have no bark. These remains are growing quite vigorously and, as the tree is now scheduled as a national monument and is surrounded by a stone wall, it may exist for further centuries.

ANCIENT TWIN YEWS AT CROMER HALL, NORFOLK

Another ancient tree was loved by the naturalist Gilbert White, of Selborne. It stands in the churchyard of the Hampshire village where he was born, lived and died. With a girth of 27 feet few can equal it in vigorous health and spread of branch, and it is one of the tallest of all yews. Although there is no direct evidence as to its exact age, it was mentioned in Saxon records of at least 1,000 years ago.

There are other magnificent yews in Norbury Park, Surrey. Meredith used to walk there, and he was fond of saying that the trees were old enough to have witnessed the Druidic rites of 2,000 years ago. Just as old as these is the venerable tree in Darby Dale churchyard, Derbyshire.

This tree measures some 33 feet round the trunk, and its great size is caused by the tree continually pushing up new shoots from the ground, and these coalescing with the old wood. As decline sets in there is a tendency for the old wood to rot, and no young shoots are produced to replace it.

A marvellous example of yew growth is seen in Datchworth Rectory garden, Hertfordshire. The yews there are known to be at least 1,000 years old. They stand like sentinels of time, their huge boles, 2 or 3 feet apart, and their great branches gnarled, twisted and inextricably intertwined, as if some giant hand had knotted them together. The outer branches hang over to the ground and make a quiet retreat within. This peaceful solitude was a great attraction to Edward Young, then rector, whose favourite haunt it was when seeking inspiration for his "Nice Thoughts".

Beautiful Fountains Abbey in Yorkshire was commenced as long ago as 1132, but there still stands a veteran yew which is reputed to have given the monks shelter during the building of the church. Farther south, the magnificent yew-tree in Harlington, Middlesex, churchyard, is one of the great trees of England. The trunk is 24½ feet round at 5 feet from the ground.

It stands 30 feet from the south door of the church, and it has been suggested that when, in ancient churches, there is found an old yew-tree, or the base of a cross, on the south side of the church, about the centre of the enclosure, it marks the spot on which used to stand the portable communion table erected by the first Christian Mission priests, more than 1,000 years ago, before the first earliest Saxon church was built, and before the Normans rebuilt it in the twelfth century. There are yew-trees in the same position in the neighbouring villages of Bedfont and Harmondsworth.

Because the most ancient of our yews are found in churchyards, their planting there has led to much conjecture as to the reason. One has been suggested, and another reason put forward is that wood for bows was necessary, and the trees were placed there so as to be free from molestation, and also because their leaves were poisonous to horses. Some were planted on the south side of churches as a protection against the south-west gales prevalent in Britain.

Others say yew leaves were much used for the services on Palm Sunday and other occasions, and because of this the tree gained a sacred character. There is also much truth in the theory that because of its long life and its being evergreen it was selected as the emblem of immortality.

The main drawback with yews is their slow growth, for at five years a yew may be no more than a foot high, and at ten years will scarcely exceed a yard. Five

(*Continued on page* xx)

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A reader has polished an oak table with white polish, and after a month finds that the surface is still soft.

Your polish has the fault known in the trade as " low print resistance." A finish should not print after adequate time has been allowed for hardening. Resistance is usually tested at 100°-200° F. by placing a weighted square of cloth on the surface. If the finish shows no sign of marking after 16 hours its resistance to printing is considered satisfactory. White polish should pass this test three days after the work has been completed. Your polish has either deteriorated or, more likely, it contains cheap gums which never become really hard. You can get top-quality white and other types of polish from many houses supplying polish to the trade.

The only remedy is to strip off the polish. You could use a proprietary stripper. This would jellify the finish and it could then be removed with a broad bladed knife followed by coarse rags. Work only along the grain. Any stain that you may have used will not be affected. Give the surfaces a day or two to dry out then wipe them over with a rag damped with methylated spirit before proceeding with the new polish. (199)

YEWS (*Continued from page* XIX)

centuries ago every man was ordered to provide himself with a bow of his own height, and this led to the destruction of many of the wild groves. So that as long ago as the days of Richard II there was danger of a famine, and an afforestation scheme was ordered. (934)

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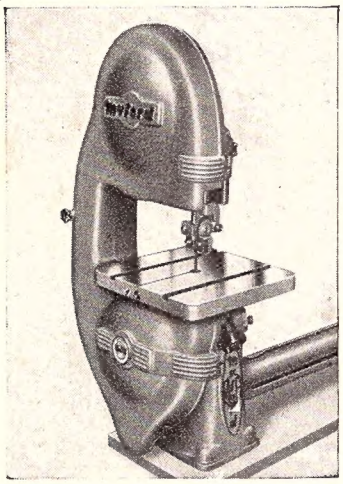

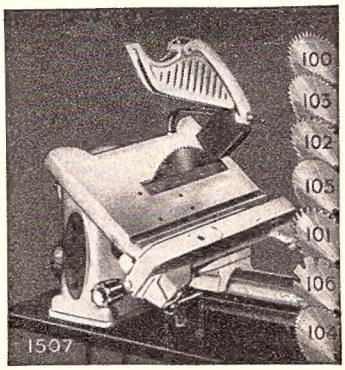

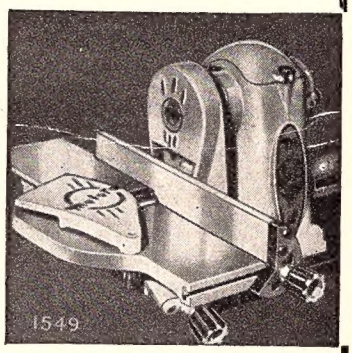

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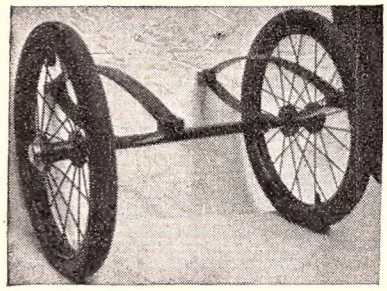

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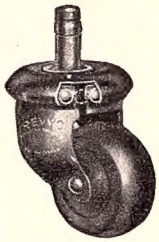

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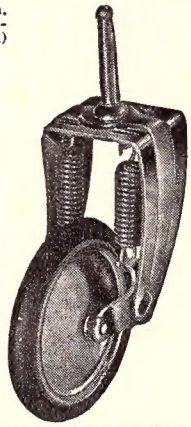

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